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# The Magazine of BOTANY & GARDENING, British & Foreign.

*Comprehending*

*Figures carefully coloured from Nature*

of

## FLOWERS, FRUITS & CRYPTOGAMIA,

WITH DESCRIPTIONS THEREOF

*Together with original & select Papers & Reviews,*

on the

## Principles and Practice

OF

## CULTIVATION.

EDITED BY JAMES BURNETT, M.A.

*And Other Eminent Botanists.*

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# PREFACE.

All who have particularly remarked the late progress of the "Magazine of Botany and Agriculture," must have perceived that we have had two objects principally in view in its guardianship. The extension and dissemination of new and valuable information, together with the repetition of that which is important, but not new, yet only partially known, in every branch that is connected with the culture of the vegetable kingdom, and the advancement of knowledge in rural affairs, has been one leading object in our conduct. The other has been, to treat of these subjec ts in such a manner as might tend to elevate the intellect of those conversant with them, and to afford rational and pure delight to the student of nature.

The cultivation of the vegetable kingdom, the capabilities of the earth, and the observance of climates, afford inexhaustible opportunities for the exercise of ingenuity, skill, and sentiment. In the history of man's knowledge it will be found, that the various branches which fall within the province of our work, have been concomitant with all advancement in intellectual, refined, and mechanical pursuits. The culture of the soil, and an acquaintance with the vegetable world, whether classed under the arts of Agriculture or Gardening, must indeed have been the forerunners, in their rudest form, of all improvements. The earliest stages of society would necessarily be conversant with uncultivated fruits and herbs, as means of subsistence, and with the flesh of wild animals. The culture of grain and the rearing of domestic creatures would follow, though slowly, it may be presumed. But as soon as such culture was employed, it would be found, that one person could obtain for his labour more than he could consume. The time and ingenuity of individuals in society would thus be often at their command, when discoveries and inventions in other arts would be matters wherein their powers obtained scope and exercise. For instance, as respects clothing, after the means of warmth had been known and secured, elegance or fancy would next have their sway, and thus would arise other demands, other arts, studies, and pursuits, till the whole community was mutually engaged and stimulated.

These are but trite views, perhaps, of the progress of mankind in civilization and art; but still, if they held true of the original condition of our race, why should not the principle be equally predominant now? But the studies connected with the culture of the vegetable kingdom and rural affairs, are as delightful and interesting as they are primeval or profitable; indeed their priority in human occupations proves the greatness of their engaging character. We need not however expatiate on a truth that is so obvious, and universally conceded. We only observe, that the rich and the poor, the female sex, and the children, all take delight in those pursuits with which our Magazine is conversant. And this brings us more closely to notice the two objects which we have had all along particularly in our eye, as already generally stated, with regard to the dissemination of information in agriculture and gardening. As these arts are amongst the most interesting and important that concern domestic life, our aim has been to diffuse as much of various knowledge in them, and at as moderate a price, as that very many of the rural labouring classes may benefit thereby.

It would be presumption in us to suppose that we can, by our own suggestions, improve the arts of which we treat; but if we disseminate that which is known, and point out wherein deficiencies or errors exist, according to those rules established in the most enlightened parts, we do better than what mere theories without facts, can ever accomplish among rural and practical men: and could we persuade every labourer and cottager in the kingdom to peruse our monthly code of facts and selections, a new and profitable impulse would be given to the exertions of many—to the tastes and pursuits of others; for we presume as respects our endeavours, that as we glean, with no slight degree of enthusiasm, others will sympathize in our feelings, and be also swayed by what has been our guide. In thus catering, it will be seen, that we have traversed the world far and near; for while the United Kingdom is our home, the people of every foreign part are our brethren, from whom we borrow, as our tastes or wants may suggest. Of the productions of other countries, and their rural practices, we often extract curious or instructive notices, from the works of the numerous and talented travellers that are constantly returning like laden bees, with the knowledge they have gathered far away. From these sources, and from numbers of works to which few can have access, we are enabled amply to fill a Magazine with what is most valuable in the unrivalled exertions and productions of our metropolitan horticulturists, or on the part of improvers in other quarters where particular branches are spiritedly pursued; and thus

we disseminate widely the most varied and advanced modes of culture for the benefit and enjoyment of persons in the most remote or unenlightened parts of the country.

Whoever has had an opportunity of seeing the "Magazine of Botany and Agriculture," need not be told, that besides the arts of husbandry and gardening, there is regularly given in each number a variety of highly finished drawings, from nature, of plants and flowers, with a strictly scientific description and arrangement. Herein is to be found matter for the scientific, and the higher orders of students, and also what may excite the unlearned to one of the most engaging and refined departments of knowledge found within the range of philosophy and natural history. So that we confidently assert, that no where, in such an accessible shape, can so much be found that is useful to the peasant and practical gardener or farmer, or interesting to the scientific botanical inquirer, upon the same terms as those of our periodical.

In speaking of the future, we must offer as our best pledge, that which has already been done in past years. We are prepared, however, to take a wider and more precise range, as respects the horticulture of other countries than our own, and think that our readers will generally be gratified to find accounts of the practices of gardeners in the different kingdoms and nations of Europe, from whom not a little is to be learned, even by English horticulturists. The same amount of letter-press, an equal degree of art and science in the strictly botanical department, and that general improvement which experience conveys, will characterize the whole.

## ON THE CULTURE OF HYACINTHS.

The Dutch mode of treating Hyacinths was long ago minutely detailed in a work by St. Simon, in which every thing that could be said on the subject will be found. By following out the directions therein laid down, hyacinth flowers fully equal to those obtained from Dutch bulbs, have been produced in this country. The compost used for the purpose at Haarlem is rotten cow dung, rotten leaves, and fine sand. In making this compost, the Dutch gardeners prefer the softer leaves of elm, lime, and birch, and reject those of oak, chesnut, walnut, beach, plane, &c., which do not rot so quickly. The cow-dung which they use is also of a peculiar quality, being collected in the winter, when the cattle are stall-fed upon dry food, without any mixture of straw or other litter. The sand is procured in the neighbourhood of Haarlem, where the soil is a deposit of sea-sand, upon a compact layer of undecayed timber, the remains of an ancient forest which has been overwhelmed by the sea.

The leaves used by the Dutch are laid in a very large heap, in a situation not much exposed to the sun, and not liable to stagnation of water, which is carefully drained from them. When they are decayed and fit for use, the compost is thus made: first, they place a layer of sand, then one of dung, and then one of rotten leaves, each being eight or ten inches thick. These layers are repeated till the heap is six or seven feet high; a layer of dung being uppermost, sprinkled over with a little sand to prevent the too powerful action of the sun upon it. After the heap has lain thus for six months or more, it is mixed, and thrown up afresh, in which state it remains some weeks to settle, before it is carried into the flower beds. This compost retains its qualities about six or seven years; but the Dutch avoid setting hyacinths in it two years successively; in the alternate years they plant tulips, jonquils, narcissuses, crocuses, lilies, &c. in the same beds; nor do they venture to set hyacinths in the compost the first season, when the fresh manure might be injurious to them. The choice bulbs are taken up every year, and the soil that lay amongst the fibres is then carefully brought up to the surface. The beds should be deep enough to prevent a possibility of the fibres coming in contact with the natural soil.

The Hon. and Rev. William Herbert says, that at his villa in Surrey, where he had the advantage of the vicinity of the fine sand of Shirley common, his hyacinth flowers were perhaps superior to those obtained from the best Dutch bulbs, and that he believes English sea-sand, or that got in the neighbourhood of Croydon, will suit as well as that of Haarlem. Where the leaves of elm, &c. cannot conveniently be kept distinct, he imagines that other leaves will serve the purpose as well, if they are left a much longer time to rot; and even old tan, if thoroughly decayed, and pulverised, may be used instead of leaves, since the Dutch have tried it with success. The difficulty in this country is to obtain cow-dung without straw. It may, however, be collected in the fields; but then it is the produce of green food, and very probably not possessed of the same virtue as that used by the Dutch. However, it may with care be gathered from the farm-yard; but it must be completely decayed, so that no portion of straw remain in it half rotten. The mischief occasioned by the fermentation of undecayed straw, and the great heat of horse-dung, &c. is a contagious decay of the bulbs; the cause of which, Mr. Herbert thinks is fungus, the spawn of which is nurtured in the dung. The Dutch, with all their precautions, are much troubled by this disease; the only remedy for which is the removal of the distempered bulb, and the compost that was in contact with it; and the cure of the bulb itself, if the injury has not gone too far, may be effected by amputation of the diseased coats.

The beds should be made about three feet in depth with the compost, consisting of about one-sixth of rotten leaves or tan, two-sixths of pure sand, and the remainder of rotten cow-dung. The compost should not be trodden down hard, but, the bed being opened, the bulbs may be ranged, and then carefully covered from three to five inches deep, but they should not be dibbled or pressed into the compost. The later sorts may be placed nearer the surface, to make them flower earlier. If the situation is wet in winter, the beds may be raised a few inches above the level of the soil; but if too much elevated they will suffer from drought. The Dutch cover their beds with dung or tan in winter, which they frequently put on or take off according to the state of the weather. They like the frost to penetrate to the distance of an inch from the bulb; if it descends deeper, they consider that the blossom will be spoiled, and if it reaches the roots, that they will be destroyed. Mr. Herbert never found the frost injurious in England, even without using a covering, but the winters are severer in Holland.

When the leaves of the hyacinths begin to wither, the bulbs should, if possible, be pulled out of the bed by the hand, to avoid the danger of cutting them with the spade. The leaves should be cut off, and each bulb laid on its side, covering it lightly with the compost, about two inches thick. In this state they should be left about one month, and then taken up in dry weather, and exposed to the open air for some hours, but not to a powerful sun, which would be very injurious to them. They should, after this, be carefully examined, and all the decayed parts removed by a knife, for which purpose it will sometimes be necessary to cut deep.

The bulbs should be placed in an airy store-room about the end of June, but not suffered to touch each other; they should be frequently examined too, in order to remove those which may shew symptoms of decay. Before they are planted in autumn, they ought to be carefully examined, not merely that all the decayed parts, but withered coats may be removed.

Mr. Herbert with much apparent propriety says, that though with greater loss from disease, any nursery-man in the neighbourhood of London may produce hyacinth bulbs equal to those imported from Holland. Nor would he be surprised, if watering the compost before it is used, with salt water or brine, should prove of some use, supposing a fungus to be one of the causes of mischief; for after trying many other things in vain, he found salt to be the only remedy for the tanner's fungus, which is so troublesome in tan-beds, and in the pots of earth in the stove.

## ON THE CULTIVATION OF CELERY.

The following method of cultivating celery differs in some points from the usual practice. The seed is sown about the middle of January in a warm situation, on a very rich piece of ground, and is well protected from the inclemency of the weather by mats at night. When the plants are from two to three inches high, they are pricked out into the nursery-bed; and, as they are found to be much injured in their future growth, if the fibres of their roots become at all dry, let them be immersed in a little water placed in a garden-pan, when they are drawn from the seed bed, so that they remain quite moist whilst out of ground. The plants remain in the nursery-bed till they are fit for the final removal, being kept clear from weeds, and watered occasionally. But they should not be transplanted until they become very strong. The ground should be prepared, by being trenched two spades deep, mixing with it in the operation a good dressing of well-reduced dung from the old forcing-beds. That the dung may be the better incorporated with the mould, a second trenching should be resorted to, and then leave it in as rough a state as possible, till the plants are ready to be put out.

In the ground thus prepared, form trenches twenty inches wide and six inches deep, at six feet distant from each other, measuring from the centre of each trench. Before planting, reduce the depth of the trenches to three inches, by digging in sufficient dung to fill them up so much. At the time of planting, if the weather be dry, the trenches must be well watered in the morning, and the plants put in, six inches apart in the

row, in the evening, care being taken, by the mode above mentioned, to keep the fibres quite wet whilst out of ground; as they are drawn from the nursery-bed, the plants are to be dressed for planting, and then laid regularly in the garden-pan. The trenches in which the rows of celery are planted being so very shallow, the roots of the plants grow nearly on a level with the surface of the ground, which seems to be advantageous; for as considerable cavities are necessarily formed on each side, when the moulding takes place, all injury from stagnant water, or excess of moisture, is prevented. The trenches, when planted, are watered as may be required.

It does not seem advisable to load the plants with a great deal of mould at first; the two earliest mouldings should be done very sparingly, and only with the common draw hoe, forming a ridge on each side of the row, and leaving the plants in a hollow, to receive the full benefit of the rain and waterings. When the plants are strong enough to bear six inches height of mould, the moulding is done with the spade, taking care to leave bases enough to support the mass of earth, which will ultimately be used in the ridge, and still keeping for some time in a hollow, as before directed. The process of moulding is continued through the autumn, gradually diminishing the breadth of the top, until at last it is drawn to as sharp a ridge as possible, to stand the winter.

In the operation of moulding, it is necessary, in order to prevent the earth from falling into the hearts of the plants, to keep the outer leaves as close together as possible. For this purpose, before beginning the moulding, take long straws of bass matting, tied together till of sufficient length to answer for an entire row; and fasten this string to the first plant in the row, then pass it to the next plant, giving it one twist round the leaves, and so on till the other end is reached, where it is again fastened. When the moulding is finished, the string is easily unravelled, by beginning to untwist it at the end where it was last fastened.

It is wrong to put much of a crop in the space between the trenches, especially one that grows tall, for celery does best when it grows as open as possible.

## METHOD OF GROWING EARLY FORCED POTATOES.

Mr. Thomas Hogg, of Pine Apple Place, Paddington, several years ago raised early forced potatoes at a period of the season previous to that in which they are produced by the usual means of a common hot-bed. The chief peculiarity of the method consisted in using an old cucumber-bed or melon-bed, in which the dung had long lost all its heat, instead of making use of fresh hot dung, whereon to grow the plants. He cut the sets about a fortnight before they were planted; for if they are not sufficiently dried before being put into the earth, they are liable to be much injured by worms. One eye only should be left in each set.

He prepared the bed by removing all the earth from the top of the dung, and covering it about one inch deep with fresh mould, on which the sets were planted in rows six inches apart, and the same distance from each other in the rows. They were then covered four inches deep with mould, and the frames and glasses placed upon the bed, which must be carefully protected from frost. The covering best adapted for this purpose is the second crop of short hay, called *rouen* in the neighbourhood of London.

At the end of the fifth day, the outsides of the old dung must be cut away from near the edge of the frame to the bottom of the bed, in a slanting direction inwards, of about fifteen inches from the perpendicular; strong linings of hot dung must be applied to the space so made, and renewed, if necessary, at the end of three weeks. Air must be given to the plants by sliding down the lights at noon every day that the weather will permit, and water in the mornings, leaving about an inch of the light open, for the admission of air after watering. The potatoes will be fit for use in about seven weeks from the first planting of the sets, and the average crop to each light, if well managed, will be about five pounds. This method Mr. Hogg continued to follow, it is believed, with the success above mentioned. Now, although the taste of the majority will prefer the old and mature root in February to those of such early appearance, yet, independent of the curious nature and result of the experiment, the price paid in London for young potatoes grown in that month, is a proof that they are in sufficient request as an article of luxury, to induce private individuals, as well as market-gardeners, to attend to their earliest cultivation.

To the above successful experiment we may add an account of a mode of continuing a supply of young potatoes throughout the year, which George H. Noehden, Esq. at one time suggested to the Horticultural Society. He says that the potatoe, from the abundant nourishment which the flesh of the tuber affords to the embryo plant, has an extraordinary disposition to vegetate; and that it seems possible to place it in such a situation that the vegetating power, being prevented from exerting itself upwards, so as to form stem and leaves, should be employed in throwing out roots only, with their appendages. This, for example, may be effected, to a certain degree, by laying up potatoes between strata of sand. In the corner of a shed or other sheltered place, or in the cellar, spread a layer of sand, and upon this put some potatoes, then sand again, and so on alternately till you have formed your pile of the height and dimension designed. The top is closed with sand. The strata of sand may be two or three inches deep. In such a pile the potatoes will emit roots and tubers, or, in other words, will yield a young produce: whilst the growing process goes on equally, near the top, in the middle, and at the bottom. Leaves and stem are not seen any where. It is only full grown and ripe potatoes that are fit for this experiment, and such in which vegetation is not impaired by premature sprouting. The old potatoes must be piled according to the times when the young ones are wanted. These will be ready in December, if the pile be formed in August, and thus one month will correspond with another. There can be no difficulty in admitting that one sort of potatoe may be better suited than another to this operation, which experience will soon point out. The *oxnoble* has been recommended; but it is probable that other varieties may be equally fit for this use, or even superior. The produce which is raised by this method is, however, not spoken of as very good; the young potatoes are generally of a loose texture, watery, and of indifferent flavour. This may perhaps be accounted for from the want of suitable nourishment, that would give them proper consistency and quality. The sand can contribute little or nothing towards the matter; and the young roots and tubers must be chiefly fed from the juice and substance of the old. If art could throw in anything to supply what is wanting, good young potatoes are likely to be obtained. What seems to be the best means to accomplish this end would be the application of a proper soil, or compost, in which the old potatoes might be imbedded before the layer of sand is put upon them. But this is a speculation which had not been submitted to experiment by Mr. Noehden at the time he gave the above account. Afterwards, however, it came to his knowledge that young potatoes had been raised in a similar manner to that described and recommended by him; and he remarked that those were the best which had been grown in mould or some sort of compost.

## MIGNONETTE THROUGH THE YEAR.

Mr. George Rishon, of the Bedford nursery, Bloomsbury, describes a method of raising mignonette in succession through the year, nearly in the following terms. The demand for this plant in pots at all seasons is so considerable, that particular attention has been given to its cultivation by many gardeners

who supply the London market; and as the same method may be with ease applied to raising it in private gardens, this detail is offered.

To obtain fine specimens of this fragrant annual, strong and ready to blow, during the winter months, and through the months of January and February, the seed should be sown in the open ground at the end of July. By the middle of September, the plants from this sowing will be strong enough to be removed into pots: for a week after this removal, they must be shaded, after which they may be freely exposed to the sun and air, care being taken to protect them by frames from damage by heavy rains, and from injury by early frosts, until the beginning of November. Many of them will now show their flowers, and then they should be removed to a greenhouse or conservatory, or to a warm window in a dwelling-house, where they will branch out and continue to blow till the spring.

The crop for March, April, and May, should be sown in small pots, not later than the 25th of August; the plants from this sowing will not suffer by exposure or rain whilst they are young; they must, however, be protected from early frosts, like the winter crop: they are to be thinned in November, leaving not more than eight or ten plants in each pot; and, at the same time, the pots being sunk about three or four inches in some old tan or coal ashes, should be covered with a frame, which it is best to place fronting the west; for then the lights may be left open in the evening, to catch the sun whenever it sets clear.

The third, or spring crop, should be sown in pots, not later than the 25th of February: these must be placed in a frame, in a gentle heat, and, as the heat declines, the pots must be let down three or four inches into the dung-bed, which will keep the roots moist, and prevent their leaves turning brown from the heat of the sun in April and May. The plants thus obtained will be in perfection by the end of May, and be ready to succeed those raised by the autumnal sowing.

## METHOD OF OBTAINING EARLY CROPS OF PEAS, AFTER SEVERE WINTERS.

The following short account of a mode of obtaining an early crop of peas, has been gathered from a paper in the London Horticultural Society's Transactions, furnished by Mr. Knight. When severe winters have proved fatal to crops of peas sowed in the preceding autumn, many gardeners have experienced the advantages of raising other plants in pots, with artificial heat, early in the spring, and subsequently transplanting them into the common soil. But an improvement in the mode of repeating this operation is here described. Mr. Knight says, that in one particular spring his garden, owing to its soil being cold and the climate rather inhospitable, did not contain in the end of February a single living pea-plant, and he purposely delayed the experiment to be explained till the first day of March. Upon that day the ground was prepared, and part of the seed sown, as usual, in rows, where the plants were to remain; at the same time other peas, of the same early kind, were sown in circles within the circumference of pots of ten inches in diameter, inside measure. These pots were filled with a compost of a peculiar kind, from the highly nutritive and stimulating qualities of which he anticipated much acceleration in the growth of his plants, with the advantages of being able to remove them at the proper period to the open ground, without having their roots at all detached from their pasture, owing to the fibrous organic texture of the compost. This was made of equal parts of thin turf, to which much lifeless herbage was attached, and unfermented horse-dung, without litter; and also of a quantity of the ashes of burnt weeds, containing, as usual, a good deal of burnt mould, equivalent in bulk to about one-twelfth of the other materials. Mr. Knight remarks that equal parts of fresh soil, with unfermented horse-dung with litter, and a small quantity of quick lime or wood ashes, would probably operate as powerfully as the compost previously described. The whole of the compost was reduced to small fragments and well intermixed, and the pots were filled with it within an inch of their tops. The peas were then sown upon the surface of the compost, and covered with common mould; and the pots were placed in a peach-house. In this they remained till the plants were an inch high, when they were removed into the open air; but they were protected during the night for some time, and particularly when the character of the evening indicated the probability of frost.

In the last week of March the plants were taken from the pots and planted in rows in the open ground, very near the whole of the compost adhering to their roots, so that their subsequent growth was not apparently checked by their transplantation. They were placed in rows contiguous to those which had been previously sown, a small quantity of compost similar to that put into the pots being added; and the common mould was then closed round their roots, and raised upon each side of the rows. Sticks to support and protect the plants were immediately added, in rather more than the ordinary number and quantity, and subsequently no particular attention was paid to them.

On the morning of the 29th of April Mr. Knight ascertained the comparative growth of his plants, which had been subjected to the different modes of treatment above described, in two rows which grew contiguous to each other, when he found the height of those which had been raised in pots to be fifteen inches, and that of the others to be scarcely four inches; and in May again he remarked that he much doubted if ever he possessed, in the most favourable season, as forward a crop of peas as at that date. On the 27th of June the full result of the experiment was seen. The plants so treated had produced a very abundant crop, and at least twelve days earlier than those sown at the same time in the usual manner, and with a much more rapid succession of produce.

Many causes appear to have operated in conjunction to produce the effects described by Mr. Knight. It has long been known that snow does not lie so long upon ground which has been manured in the same season with fresh unfermented horse-dung, as upon unmanured ground; and therefore it may be concluded that some degree of heat existed in the compost, and emanated from it, though probably never to the extent of being felt by any warm-blooded animal. If placed in a heap, such a compost as the one described, and even when the horse-dung is much less in quantity, will heat violently. If heat, says Mr. Knight, was in any degree generated by the compost in which the peas grew, the escape of it was necessarily retarded by the numerous sticks by which the ground was partially covered, whilst little injury could have been sustained from their shade, because the quantity of light comparatively with the temperature of the air and growth of the plants is very great after the vernal equinox, and it is every day increasing in power and influence.

Another cause of the rapid growth of the transplanted peas has probably been the very favourable state of the soil in which they had been placed, which had been turned over with the spade immediately before transplantation took place; for peas never thrive well in strong soils, when such have been compressed and soddened in early spring by much moisture. But the chief causes of their very rapid growth must have been the highly nutritive and stimulating quality of the compost, and the presence of some degree of additional warmth. Mr. Knight mentions that he has frequently derived great advantage from placing a moderate quantity of nearly similar compost immediately under rows of peas which have been sown in the usual way, except that the seeds were placed upon the surface of the soil within which the compost had been buried, and covered by having had the soil collected from each side, to form a ridge over them. In all cases where a compost of the kind described is employed to accelerate the growth of dwarfish and early peas, it should be used in small quantities only, that the early growth

of the plants may be promoted without excessive and consequently injurious luxuriance being given. For transplanted peas Mr. Knight prefers a poor and light soil, so that the roots may be led, as they will be under such circumstances, to confine themselves to narrow limits, and the plants consequently brought to an early maturity.

## THE PHYSIOLOGY OF PLANTS.

The scientific inquirers into the phenomena of nature, which have of late years figured, are neither few in number nor mean in accomplishments. Still they may be divided into two classes, upon one important ground. There is a class which, till lately, seemed to enlist into its ranks the most illustrious names; whose reasonings and conclusions, whether disingenuously conducted or not, we must not at present assert, opposed, directly or indirectly, many statements in the Bible, from which the most peculiar doctrines of the Christian religion in a great measure depend. This class, from its numbers, the names it could boast, and the fashion in science which it established, became so formidable, that he who confessed himself a Christian, was laughed at, when he added the term Philosopher. For the days of Newton, Locke, and Boyle had gone bye. But the nation and Europe can now, we are happy to say, point with triumph to a second class, who, if their researches have not found out so many new facts as the scorners did, can, with the most complete power, turn, or rather apply those facts to the illustration and enforcement of sacred truth.

Within a very late date, there have been many of these sacred ministers employed in teaching us the true philosophy, who have not dimmed or disfigured the most brilliant facts by a cold and heartless infidelity, but who have made us to behold the power, the goodness, and the wisdom of the Creator more clearly than ever, and to perceive our own imperishable nature, rights, and ends, in a manner that, while he is exalted, we are enlightened. The writers of the Bridgewater Treatises have acted effectually in this department, with many other authors whom we could name. The little work before us, which has been for some time in the hands of the public, belongs to the same able and benevolent school. We do not say that it teaches new truths, or that it will yield much information to him who has previously made a study of the science of which it treats. But it is capable of doing something no less important. For from it, the unscientific reader will derive much of the riches which have been discovered, and these set in an advantageous and attractive light.

The author is an enthusiast, as well as deeply versed in the physiology of plants. It is not the mere nomenclature of plants he cares about, but the history, the structure, the uses, and phenomena of vegetation in its endless variety and beauty: each and all engage his ardour; an ardour which has been unremitted, as we learn from him, for many years. And as we have before hinted, he finds and exhibits the whole as manifestly declaring wisdom aad contrivance that are from above. As introductory to the extracts we are about to submit to our readers, we add, that as a graceful, enthusiastic, and enlightened manual, we recommend this little volume to every general reader, be he old, or be he young.

The work is divided into thirteen chapters, in which the structure, attire, and composition of plants are first treated of. The root—the stem—the blossom—seeds—phenomena of germination—secretions—vegetation—light and electricity in relation to plants—and their age, are all separately, clearly, and engagingly discussed. We string together a few extracts taken from this intelligible and agreeable arrangement of the subject.

"The bark, wood, and pith, are general terms, comprehending the mechanical structure of the trunk and twig, or branch, the ramification of the stem. The epidermis is a thin film, which covers the bark, and forms a defence from external injury. In the birch, when in an advanced stage of growth, it is white and silvery, easily recognised even at a distance, and thus adds a peculiar feature to the landscape; it peels off readily in thin laminæ. In the aucuba japonica, or gold plant, the epidermis is yellow; it is, however, generally colourless, and occasionally transparent. In leaves, the epidermis possesses a reticular or net-like structure, and the meshes of the tissue vary in different plants, but are fringed at the edge by spiral vessels. In reeds and grasses it contains much finely divided silicious matter; hence, two portions of ratan cane emit sparks by collision; and the equisetum hiemale is used to polish wood, and employed by the Swiss, among the vallies of Switzerland, &c., as a substitute for sand-paper, in their beatiful models of Swiss cottages and dairies. A stem of barley may be fused into a transparent globule, and lightning has converted the hay-rick into a vitreous mass. The equisetum has been used to give a keen edge to the razor; and the Dutch reed in polishing, derives its efficiency from the same source; also the teazle, dipsacus fulonum, employed by the clothier to raise a regular pile or nap on the surface of the cloth. Mr. Knight sharpens razors from the ashes of the *Elymus arenarius*, and other marsh grasses; also the ashes of wheat. Stedman mentions, that there is in Surinam a species of grass, the edge of which cuts, like a razor, the legs of those who pass through it: the edges of the *Scleria grandis* are as sharp as glass. No doubt, tropical forests and jungles are often set on fire by the collision of the silicious matter of the ratan and other canes, when shaken with the wind. The epidermis clothes the most delicate petals of the flower, as the foliage, the stem and the root. It seems to be altogether distinct and peculiar, is pervious to light, and is at the same time an absorbent and exhalent membrane, as well in its relations to moisture, as to gaseous media. It is probable, that these composite functions are connected with the presence and absence of light, and increase or decrease of temperature: with both of these electricity is connected."

We pass over the author's observations on the bark and wood, and call the reader's attention to one of the uses to which the pith of plants has been devoted:—

"From the *pith* of the papyrus antiquorum were formed the papyri of Egypt, found in the sycamore (ficus fatua) coffins, the dormitories of mummies, as well as those recovered from the ruins of Pompeii and Herculaneum. The 'paper reeds by the brooks,' are mentioned in the prophetic records, several centuries before our era: the papyrus still clings to such spots among the marshes of Egypt, and the Delta of the Nile; and forms a beautiful ornament on the banks of the Anapus: that found among the swamps, near the ancient Syracuse, seems to be a variety, if not a distinct species; and M. Lippi states his having found two species different from the true papyrus antiquorum of modern botanists. The cyperus papyrus of Linneus rarely exceeds ten feet in length, which is about that of a specimen in my possession, though Pliny says the root was as thick as a man's arm, and that the plant occasionally exceeded fifteen feet in height. Its stem is imbricated, of a triangular shape, and tapers towards the summit. The head of the papyrus is composed of a tuft of small grassy filaments, about twelve inches long; toward the middle, each filament separates into four, and in the partition are four branches of flowers, not unlike an ear of wheat, but forming a soft and silky husk. The flower of the papyrus was used in ancient times in religious ceremonies. We have seen a very fine and tall specimen of the papyrus antiquorum in the lecture room of the Botanic Garden of Edinburgh, growing in a vessel of water. This celebrated plant supplied the paper or writing material of ancient times: and, in the natural history of Pliny, we are supplied with a description of the process employed for making paper: the papyrus was separated into thin slices, by a fine point; these were brought into contact by their edges, transverse slips were again superposited on them, with their edges

in similar contact; this done, the mass was sprinkled with Nile water, and submitted to pressure. This ancient paper, which became an important branch of Egyptian commerce, especially with the Roman Empire, and in the reign of Augustus, we have every reason to believe was thus formed. If we hold up a specimen of Egyptian papyrus between the eye and the light, the ribs may be seen parallel, and crossing each other at right angles. We have seen two specimens of modern papyri, manufactured by the Chevalier Landolina, of Syracuse, by a process similar to that described by Pliny, in which the medulla, or pith, was employed, *not* the external rhind of the reed, as has been generally supposed. One of these specimens I saw at the Studio of Naples; the other in the British Museum, with a description of the process in Italian, both presented by Landolina. I have compared each of these with Egyptian papyri, also with those recovered from Hereulaneum, and there can be no doubt that the process employed has been the same. Dr. Schouw, of Copenhagen, supplied me with a detail of the process communicated to him personally by Landolina, and it is substantially what has been stated. I have myself tried the same experiment successfully, on a small scale. The paper formed from the paper reed was in high estimation in the time of Alexander the Great. Ptolemy Philadelphus king of Egypt, when he commenced his library, and collected an immense variety of books, had them copied on this kind of paper. In his reign, considerable quantities of the paper were exported, which was, at length, however, prohibited, to prevent the king of Pergamus from establishing a rival library. Paper made from the papyrus was principally manufactured at Alexandria, and the city was considerably enriched by the exportation of this paper. Vopiscus mentions one Fermies, who boasted that he could maintain an army from the value of his stock of paper: when it began to be disused is not certainly known; as late as the fifth century it was in general use in Europe, and in Italy and France, was continued to the eleventh and twelfth centuries."

On roots, which serve as the anchorage of the plant, and their capillary tubes, by which the plant is sustained, as also on the diversity of forms which the roots of different plants assume, he is lucid and entertaining. Mark the power of this portion of the objects treated of.

"The power of the vegetating root is sometimes astonishing; it will grasp pebbles, and completely weave a fibrous web round them. M. Priot had experimentally shown, that the radicles of seeds, when germinating, were capable of penetrating mercury. A seed of the lathyrus odoratus, the cotyledons of which do not unfold themselves during the act of germination, was placed one-fifth of an inch from the metallic surface, previously moistened; germination took place, and when the radicle reached the mercury, it pierced, and buried itself within its substance. Dr. Butler, of Shrewsbury, informed me that he had supplied a number of peach and nectarine trees, trained to a wall, with a quantity of bones, by way of manure: some years afterwards, he had occasion to remove the wall, and when the fruit trees were taken up, the roots were found completely investing the bones, and in numerous instances the tips of the roots adhered, like so many suckers, to the surface of these bones, the tips being flattened in contact with the bone. The root of the couch, or squitch-grass, will pass through the solid tuber of a potatoe; but I am not acquainted with a more extraordinary instance of the force of vegetation, in reference to the couch-grass, than the following:—In taking up last November, some bulbs of the tyger lily, I found two of them completely threaded by the repent root of this grass, so that the bulbs, were monoliform, or like beads on a string. The roots of the laurel will overturn a wall; and in Needwood Forest, I have seen the holly luxuriant on the summit of a venerable oak, its roots having cleft and penetrated the stately trunk—and, in Alpine regions, the calcareous and gigantic rock has been rent in twain, by the penetrating root, as by a wedge. This tremendous force would no doubt be partly occasioned by the infiltered water, which would follow the root, the rent having been begun, in the first instance, by absorbed moisture, &c. We have been informed that the root of mint grows much more rapidly during night, than by day; the plant for the experiment was reared in a glass of water."

What heart is there which swells not with noble sentiments when he beholds a stately tree? Those here spoken of must have been noble *fellows*, and worthy to sentinel a mountain for ages.

"Lewis and Clarke report that the pines on the Columbia river exceed the height of 300 feet. According to Mr. D. Don, a distinguished botanist, the purple-coned fir of Nepal, found at an elevation of from 8,000 to 10,000 feet above the level of the sea, is a magnificent pine. 'This, which may be regarded,' says Mr. Don, 'as the silver fir of Nepal, surpasses all others of the fir tribe in beauty: its lofty and pyramidal form; its numerous, long, erect, cylindrical purple cones, studded with drops of pellucid resin; and its flat leaves, silvery underneath, and of a bright shining green above, which thickly adorn its ash-coloured branches, render it a truly picturesque object: the trunk is from 70 to 80 feet high, perfectly straight, covered with a somewhat smooth grey bark, and having a circumference of seven or eight cubits.'

"Not to mention the venerable oaks of huge diameter, in this country, and many of which we have seen, the boabab *(adansonia digitata)* has been found 77 feet in circumference, and even in solitary cases, 100 feet, while the altitude of the stem seldom exceeds 15 feet. The chesnut, on the flanks of Etna, called *custagno di cento cavalli*, measures one hundred and eighty feet, and though now in fragments, it is unquestionable that these stems were once united. Professor Schouw, of Copenhagen, informed me that he had the question distinctly ascertained, by having the earth removed around it, and found the entire trunks united below ground into one. The dragon-tree at Oratava, in the island of Teneriffe, is 48 feet in circumference. According to Labillardiere the largest cedar on Mount Lebanon is nearly 28 feet in circumference. An oriental plane, in the valley of Bajukdere, near Constantinople, has a cavity of 80 feet in circumference. The tree at Huahine, called by the natives *aoa*, described in Bennet and Tyerman's 'Voyages and Travels,' is probably a mangrove, judging from the description. The girth of the trunk of this cloistered tree is stated to be 70 feet. The banian of the Nerbuddah, notwithstanding the invasion of the waters on its territories, is still upwards of 2,000 feet in circumference round its principal stems. Some years ago, the bole of a large black walnut tree was brought from Lake Erie, in America, to this country, and we believe is still exhibited in London: it measured 36 feet around, and was excavated and furnished as a sitting room."

"The flower or corolla," says the author, "is that painted physiognomy by which the plant is recognised, and referred in the Linnean arrangement to its individual station among the tribes of vegetation." We take notice of this definition merely to show that the writer is no friend to the *natural system*, which he calls "the most *unnatural* jumble of incongruities that ever were collocated together." But of the part in question—

"Pliny, with rare felicity, characterized the flower as the 'Joy of Plants,' *Flos gaudium arborum;*—the rose, the amaryllis, and the tulip are splendid attestations to this poetic truth. The corolla is adorned with all the coloured imagery of the prism, sometimes singly, at other times mingling its chromatic rays together on one disc, as if the rainbow had impressed its beauteous seal on the fair canvass of the flower. At other times we find the flower of dazzling whiteness, unrivalled even by the snow. 'To paint the lily,' is proverbial for what cannot be improved; and who would dare to do it? Besides its showy ornaments, the fragrance of the flower, as in the rose, is not less delightful, though there be some that cannot so well com-

pete for the distinction; but the incense of flowers is often wafted afar on the breeze, particularly remarkable in the spice islands, the approach to which is announced at an immense distance at sea.

"These beautiful insignia of trees consist individually of a variety of parts, all contributing their share to the perfection of the whole: the bractæa, or floral leaves, sufficiently conspicuous and distinct in the artichoke, are sometimes present, and at other times absent; sometimes they are green, as in the case referred to, as well as hypoxis erecta; or they are coloured, as we find them to be in the examples already cited. In the bartzia coccinea, the bractea are a bright scarlet; in the tilia europea, a pale yellow; and in the salvia hormium, a beautiful purple. The bractæas are more permanent, usually, than the calix: the chalix or flower-cup is commonly the colour of the leaf, as in the pink and carnation; though it is also occasionally coloured, of which the fuschia coccinea or common fuschia, affords a beautiful example; the scarlet, or rather crimson envelope, being a true calix, while the rich purple fillet it encloses is the corolla.

"The corolla is usually distinguished from all other parts of the plant by its rich and brilliant drapery—it is frequently white, but usually painted with the most exquisite colours, and sets all art at defiance to imitate. One example of a green flower has been given; the flower of the daphne laureola is another of the same kind.

"The variety in the forms of the corolla of plants is as countless as its hues: it is of one piece, as the bignonia or convolvolous, and of an elagant bell shape in the lily of the valley, convallaria majalis—

'The silver mistress of the vale!'

or, composed of numerous segments or pieces, as in the white or orange lilies. The palms exhibit that peculiar form of corolla, called the spatha or sheathe, of which the beautiful white fillet of the cala ethiopica, forms an elegant type: the personate or masked, and the ringent corollas are singular and curious: the snapdragon and monkey flower will readily occur as examples. Among these are to be found the lobelia cardinalis and fulgens, as well as the salvia splendens; rich and dazzling in the attire of their corollas. But in point of singularity of structure, they are surpassed by several of the orchideœ; in the fly orchis, ophrys muscifera, the flower so much resembles a fly, that it might be readily mistaken for one."

Speaking of seeds, the following passage regards a wonderful contrivance for the propagation of objects not endowed with locomotive power.

"The dispersion of seeds also supplies us with a chain of curious contrivances, admirably suited to the purposes for which they are designed; and it is a subject of regret, that these singularly constructed species of mechanism have not been so minutely investigated, as the interesting subject merits; well might Forskal say! 'Miro, nec adhuc investigato mechanismo propelluntur semina.' The capsule of the violet will project its contained seeds to a distance of several feet; and the elastic arillus of the wood sorrel will eject them over a considerably greater space. The euphorbia coccum (Grœtner) is also remarkable in this respect, as well as some of the ferns, which possess an elastic ring for the purpose; geranium, fraxinella, and others. The crackling of the capsules of furze in a warm summer day must be familiar to many, and is sometimes the only sound which breaks the stillness of the landscape. The scales which enclose the seeds of pines sometimes open suddenly, and disperse their contents. The noise occasioned by this mechanical impulse on the air, may be often heard at a considerable distance: 'This crackling voice,' says Mr. Keith, 'was observed and traced to a fir-tree, namely pinus, pinea at Kendlesham parsonage, on July 14, 1808, by two young gentlemen, my pupils, who thought the tree was bewitched, till the cause of the noise was pointed out to them.' A species of wild cress, cardamine impatiens, suddenly unfolds its seed vessel, on being touched. I have, when handling the plant, and more minutely examining the structure and elastic apparatus of the seed vessels, been temporarily deprived of vision, by the impulsion of the seeds into my face. The balsam, *balsamimum*, is not less curious than the rest of these, and has been not inappositely, from the elastic force employed by the seed pod in the dispersion of its contents, called 'touch me not.' In these cases, the power of the projectile seems to reside in the elasticity of the valves of the capsule."

An imposing and venerable idea is suggested by the age which some sort of trees reach to, that, joined with the stately and gallant appearance already spoken of, leads us to remember, and not to marvel, that they have been considered hallowed and sacred in heathen countries. We can feel something like respect for an aged tree, and wonder less how kindred sentiments would guide a benighted pagan. We would walk many a mile to look on one of those described below. We would strive to embrace it, and address to it, with head uncovered, a soliloquy regarding the olden time.

"There were, in 1776, in the palace garden of Grenada, several cypresses, which formed a cypress grove, and computed to be eight or nine centuries old.

"Pliny mentions a plane tree in Lycia, hollowed out into a cave, eighty feet in circumference; there is an oriental plane in the valley of Bujukdere, near Constantinople, which embraces a circuit of 150 feet, and has a cavity of eighty feet circumference. The oriental plane of Stanchio, an island in the archipelago, formerly Cos, is remarkable for its size, and no doubt has a corresponding age. Earl Sandwich, in 1739, measured forty-five paces from the trunk to the extremity of the branches; these branches are supported by pillars of marble, verde antique, and porphyry; and though time has assailed it, it is still immense. 'Some notion,' says Dr. Clarke, 'may be formed of the time those props have been so employed, by the appearance of the bark: this has encased the extremities of the columns so completely, that the branches and the pillars mutually support each other: and it is probable, if those branches were raised, some of them would lift the pillars from the earth.'

"There is a yew tree at Peronne in Picardy, which was known to be flourishing in 634; it still existed in 1790, consequently was 1156 years old: there is also an Italian fig, in the Isle of Thanet, supposed to have been introduced by the Romans in the first century. The yew near Staines, at three feet high is nine feet three inches diameter, and the extent of its branches embrace a circle of 207 feet: that it is of a very considerable age there can be no doubt.

"Eight olive trees still remain on Olivet, said to be 800 years old; and it is ascertained that they existed prior to the capture of Jerusalem by the Turks. Mount Lebanon, and the range of the Taurus, are the native soil of the cedar of Lebanon. It is a magnificent and beautiful tree, and several very venerable and noble specimens still decorate the flanks of Lebanon. According to Labillardiére, the largest of these patriarch trees is at least nine feet in diameter. The trees are still held in great esteem, and an annual festival is celebrated beneath their shade, called the 'feast of cedars.'"

We conclude by telling our readers that this little volume contains learning, research, talent, and sound philosophy, put forward in the most agreeable style. In truth, it is a delightful book; and more especially so, as there is a spirit predominating in every paragraph, which shows that the author is a man of enlightened piety; and to whom there is

"Not a tree, a plant, a leaf, a blossom,
But contains a folio volume,"

written in testimony of the goodness, wisdom, and providence of God.

—o—

## ROYLE'S HIMALAYAN BOTANY.

SEVERAL months ago we took up the two first parts of this splendid work, on the botany and other branches of natural history, as presented in the regions of the Himalayan Mountains and in Cashmere, which are amazingly rich in such productions; and we now proceed to the third and fourth parts, which have since been published, that our readers may have a taste of what is therein contained. We shall first of all abridge part of the introduction, embracing general and geographical details, which continues to form a considerable portion of the third part, and serves to guide the mind with greater precision and interest to the scientific points afterwards discussed.

Though extensive tracts of the Himalaya remain unexplored, the uniform result of every observation establishes the great elevation of this chain of mountains. Captain Herbert, speaking only of the surveyed portion of them, observes that there are no fewer than twenty-eight peaks in the Himalayas which overtop Chimborazo in South America. But to form a true estimate of these mountains it is necessary also to take into consideration their breadth as well as length, and enormous height. This is supposed to be greatest in the vicinity of the lofty peaks near which the principal rivers have their rise. Crossing from the plains of Hindoosthan to the snowy passes, the distance is not less than 80 or 100 miles. In no part is there any thing like table-land to be found; but seen from the plains of Northern India, the Himalayas appear formed of a succession of parallel ranges, though nothing of this kind is apparent when we enter the mountains themselves, for in ascending any of the principal points, a number of arms are seen radiating in every direction, separating deep ravines, connecting the different mountains together, and throwing the waters of the several rivers in opposite directions. Notwithstanding this irregularity, the ridges generally run parallel to the direction of the mountain mass; for in proceeding transversely across it, we have constantly a series of ridges to ascend and descend, and narrow vallies to cross.

Crossing these mountains, the descent on the side of Tibet, according to the concurrent testimony of all travellers, is gradual, and not of great extent, though the ascent up the southern face had been so considerable. It is evident, therefore, that the land on the northern face is much elevated. The different aspects, climate, heights, and soils of this immense region, must consequently afford a prodigious variety of natural productions.

The parts now before us of the work we are considering are devoted to botany, and describe several orders of great commercial value. Take of Lineæ the following species:—

"*Lineæ.*—This order, named from, and chiefly composed of the genus Linum, of which one species has been known for its important uses from time immemorial, is found chiefly in Europe and the north of Africa, but also in most other parts of the world, though not very numerous in species any where. In India one species, L. Mysurense, has been found in the Peninsula, and by myself on the Mussooree and Kedarkanta mountains. At the foot of the hills, and at moderate elevations within them, are found the different species, L. Cicanoba, trigynum, repens, and tetragynum, which are all distinguished by the showiness of their flowers, are closely allied among themselves, and differ from the rest of the genus. Mr. Bentham suggests that L. repens is only a variety of L. Cicanoba. This I have found varying so much, that even L. trigynum, of which the older leaves, as Dr. Roxburgh mentions, are serrate, may be a variety of it, as well as L. tetragynum.

"In the plains of India, Linum usitatissimum is found every where in a cultivated state in the cold weather months. This plant, so well known for the tenacity of the flax yielded by its fibrous bark, from which, in the present, as in the most ancient times, linen cloth was manufactured, and which is subsequently converted into paper, is valuable also for the mucilage yielded to water, and the oil to pressure, the first by the covering, and the other by the almond of its seed; while the residue forms an oilcake fit for the food of cattle. Flax, extensively cultivated in Europe, is imported into England, chiefly from Russia; and linseed from both America and Holland. In Egypt, as in ancient times, it is much cultivated in the present day; it must long have been introduced into India, probably from the northward; but its names do not give us any assistance in tracing it to its source; as the Sanscrit atasee, Hindee atees, Bengalee mushina, have no resemblance to the Hebrew pishtah, Arabic akshoot, Greek λινον, or Persian kutan. The latter, remarkable for its resemblance to qootn or kutun, the Arabic name of cotton, but this is written with the Arabic, and the former with the Persian kaf. In India the flax is cultivated only on account of its seed, of which the mucilage is valued as a demulcent in medicine, and the oil in the arts; but the plant, which in other countries is most valued, is there thrown away; and others, such as Hibiscus cannabinus and Crotalaria cannabina, are cultivated almost in the same field, for the very products which this would yield. It seems worthy of experiment, therefore, to ascertain whether a valuable product might not be added to the Indian agriculturist's profits, without much additional expense. Flax having been manufactured into linen cloth, both by the Egyptians and the Hebrews, as we learn from the sacred writings, as well as from Herodotus, and know from the mummies being exclusively, as far as hitherto ascertained, wrapped up in linen clothing, it is curious that the practice of converting flax into linen should not have passed into India. This, I conceive, can easily be accounted for by the latter possessing the cotton plant, of which the weavable portion is more obvious, elegant, and well suited to the climate."

In addition to what we have in another number extracted from this work on the cotton plant, it will not be unacceptable that we should present, on a subject so important to England as well as to India, some further observations on the species or varieties which are cultivated in different countries, with the view of leading to improvements in its cultivation. But here there are great difficulties to encounter, as botanists have generally neglected the subject, and omitted mentioning the cultivated species, while cultivators have used provincial names, or applied new ones of their own, to the exclusion of any notice of the names in use among botanists. The celebrated De Candolle has admitted thirteen species, observing that they are all uncertain, whilst Dr. Roxburgh has added two, and others have described a great many more. With the assistance of the observations of this last-mentioned gentleman, who states that he had studied the subject for thirty years, and some other eminent botanists, the author hopes that the following kinds, cultivated in different countries, has been by him referred to their true species.

"1. G. obtusifolium (Roxb.) Shrubby, very ramous. Leaves small, with three, rarely five, obtuse, ovate, entire lobes. Stipules falcate. The exterior calyx with entire divisions. Capsules ovate, cells three-seeded. Seeds free, and clothed with firmly-adhering, short greenish-gray down, under a small portion of ash-coloured wool.—Roxb. Fl. Indica. vol. 3, p. 183. A native of Ceylon, but not cultivated. Flowers during the rains and cold season in the Botanic Garden at Calcutta.

"2. G. acuminatum (Roxb.) Sub-arboreous. Leaves from three to five lobed, lobes oblong, tapering, very acute. Exterior calyx deeply lacinate. Stipules linear-lanceolate. Capsules long, ovate, much pointed. Seeds many, adhering firmly to each other, black, and free of every pubescence, except the long white wool, which is easily removed.—Roxb. Fl. Ind. 3, p. 186.

"Dr. Roxburgh states that this species is easily distinguished by its superior size and large black seeds, which adhere firmly to each other. It is said to be a native of the mountains to the north and westward of Bengal, but he does not find that it is ever cultivated; but it is apparently a species well worthy of trial in different parts of India, as it is indigenous, and desirable on account of the facility with which the wool separates from the naked seeds.

"3. G. herbaceum (Lin.) Stems woody, bi-triennial, 4-6 feet high in tropical, herbaceous and two feet high, in temperate climates, the older parts reddish, the younger, as well as the flower and foot-stalks, hairy, frequently marked with black spots. Leaves hairy, palmate, 3, generally 5-lobed, in herbaceous varieties, lobes broad and rounded with a little point; in those which are woody sub-lanceolate and acute, with or without glands. Stipules falcate-lanceolate. Flowers axillary, generally solitary towards the extremities of the branches, petals of a lively yellow colour, with a purple spot near the claw. Segments of the exterior calyx or involucel, D.C. cordate at the base, margin dentate, sometimes entire. Capsules ovate, pointed, 3 or 4-celled. Seeds free, about five in number, clothed with firmly-adhering, grayish down, under the short-staple white wool.—Xylon s. Gossypium antiquorum.—G. herbaceum. Linn. sp. Pl. 3. p. 355. Lamarck Encycl. 2. p. 133. Cav. Diss. 6. p. 310. t. 164. f. 2. Wild. 3. p. 803. Roxb. Fl. Ind. 3. p. 184. D.C. Prod. 1. p. 456. This and its varieties are by far the most generally cultivated in India. Dr. Roxburgh particularly distinguishes three varieties:—1st. Dacca Cotton, which furnishes that fine long soft cotton-wool, employed in manufacturing the very delicate beautiful muslins of that place. v. Roxb. Corom. Plants. vol. iii. t. 269. 2d. Berar Cotton, distinguished by growing to a greater size, and having smooth and straight branches, leaflets of the exterior calyx more deeply divided, and the wool of a finer quality than in the common variety of this species. This is cultivated in Berar and the Northern Circars, and with its cotton the fine Madras, more properly Northern Circar, long-cloth is made. 3d. China Cotton, introduced into Bengal, where its wool, according to Dr. Roxburgh, is reckoned 25 per cent. better than that of Surat. Lamarck's G. indicum. Encycl. 2. p. 134. Capas, Rumph. Amb. 4. p. 33. t. 12. Dr. R. says, is no doubt one of these varieties; Cavanilles (Diss. 6. p. 314. t. 169.) having seen it in flower in Paris, was of the same opinion. The variety cultivated about Cawnpore and in the Doab, is figured tab. 23. fig. 1. from a drawing in General Hardwicke's collection. There are also specimens from Saluen and Tavoy."

The Tiliaceæ are closely allied with the Malvaceæ, the order which embraces the cotton-plant, and like it includes species that are turned to important practical purposes:—

"*Tiliaceæ.*—The Tiliaceæ, though named from an European timber-tree, are chiefly found in tropical countries. The genera Corchorus, Triumfetta, and Grewia, of which numerous species are found in India, are also abundant in the warm parts both of Africa and America; and as has been remarked with the plants of some other families, many of the same species are found in the most widely separated parts of India. Grewia betulæfolia, with Corchorus linearis and fascicularis, extend from the Peninsula up to the arid region on the western bank of the Jumna, where a new species, C. prostratus, is also found. Corchorus capsularis and acutangulus, as well as Triumfetta angulata, are common at Saharunpore, as in the most southern provinces. In the tract of jungle and forest, which clothes the foot of the Himalaya, we have several of the species which are found in similar situations in Bengal and Assam, as Triumfetta æstuans, Grewia helicterifolia, tiliæfolia, and sapida, which is apparently the same as G. pumila, Don, and G. nana, Wall. Triumfetta oblongata extends as high as Jureepanee, or five thousand feet above the sea; and Corchorus humilis (nob) shews itself fifteen hundred feet higher up, but both only during the rainy season. Grewia sclerophylla, didyma, oppositifolia, and elastica, are found in the Kheree Pass, in the Doon, as well as higher up within the Himalaya, particularly in the neigbourhood of villages.

"As we have seen with the Malvaceæ, and the other allied orders, so are the Tiliaceæ remarkable for mucilaginous properties, as well as for tenacity of fibre; and several species of the genus Grewia have pleasantly-tasted acid berries, as was found among the Malvaceæ, in the fruit of Hibiscus Sabdariffa. Corchorus olitorius is in India, as in Egypt, used as a pot-herb, and is in Bengal cultivated for the fibres of the bark, which are called jute and pat. C. capsularis is likewise cultivated in Bengal as in China, for the same purpose. Its fibres, as well as those of C. olitorius, are employed in making a coarse kind of cloth, called tat, of which gunny, or rice-bags, are made; also a coarse kind of linen worn by the poorer people in some parts of Bengal, as we are informed by Dr. B. Hamilton; of it also the cordage employed in agriculture, and for rigging boats, is formed, and it is the material from which paper is made. The inner bark of Grewia oppositifolia, as that of Tilia, or lime-tree, is in Europe, is employed for the same purposes, at lower elevations within the Himalaya; and the leaves of some species, as of G. didyma, are given as fodder to cattle, and are even stacked up for winter use. As the wood of the lime-tree is valued for its close grain, lightness, and smoothness, so Berria Amomnilla, or Trincomalee wood-tree, affords timber, valued also for its lightness and strength, and is employed in the construction of the excellent Massoola boats of Madras. Grewia elastica, figured at Pl. 22, called dhamnoo by the natives, and common in the Himalayas in northern latitudes, at moderate elevations, affords timber which is highly valued for its strength and elasticity, and therefore much used for bows, buggy shafts, and bangy sticks. Some of the species of Grewia, as before mentioned, yield pleasant acid berries, much used for making sherbet. Of these, G. asiatica may be instanced as common in gardens; but G. sapida, helecterifolia, sclerophylla, and others, are used for the same purpose."

Of some of the plants that belong to the order Ternstræmiaceæ we shall take occasion to refer to this work at another time, on account of their extensive commercial interest. At present, however, we quote the scientific notices of the author respecting the family generally:—

"Of all those which belong to this family, the tea-plant is alone of any commercial importance, but this in so pre-eminent a degree as to render it a most desirable acquisition to other countries. An inquiry into its history and habits, therefore, becomes interesting, that we may ascertain whether it be so local and peculiar in its nature, as to render futile any attempt to introduce it elsewhere. To do this satisfactorily, it will be necessary to enter into some detail respecting the varieties or species which afford the different teas of commerce, the extent of their distribution, the climate, soil, and culture, which they prefer, as well as the plants with which they are associated, either in a wild or cultivated state.

"The tea-plant has been supposed to be indigenous in the mountains which separate China from the Burmese territories; but we are informed by Dr. Abel that he found a small shrub, of what is commonly considered the green variety, apparently in its natural habitat, and near no plantation, at See-chou, in the province of Kiang-sea, about N. lat. 26 deg., where the hills were covered with pines. Thunberg states that tea grows every where in Japan, both naturally (*sponte*) and cultivated, on the margins of fields. One species, so named, is described by Loureiro, as found both cultivated and in a wild state, in the northern provinces of Cochin-china; and the same author describes T. oleosa as common about Canton, both wild and cultivated. To the kindness of Mr. Reeves I am indebted for the information that there is a species of Thea, growing wild in the neighbourhood of Macao, which is much larger in the leaf than either the black or green tea plants.

"But it has been made a question, whether the varieties of tea known in commerce are due to difference in species, or only to differences in soil, climate, culture, and mode of preparation. The latter appears to be the opinion of Kæmpfer, Thunberg, and Siebold, as they admit of but one species of Thea, and is that now generally entertained; Thunberg notices two varieties of Thea bohea, but says they can hardly be distinguished into species. Siebold says that the variety viridis of T. Chinensis, D.C., is a shrub every where cultivated in Japan; but the variety bohea he had only seen in gardens, introduced from China. From this fact one would be inclined to conclude that

they were distinct; and as all the observations were made in Japan, it is probable they all three only saw one species cultivated there: as there is reason for believing, that the opinion of Linnæus that two species of Thea yield the teas of commerce, is the more correct.

"Dr. Abel, when passing through the tea country, had little doubt of there being two species of tea-plant; but he could not at the time define the character, and was unfortunate in losing his specimens in the shipwreck of the Alceste. But he mentions that the plants from the black and green tea districts differed in the form, colour, and texture of their leaves; those of the green tea being larger, thinner, and of a lighter colour than those of the black, though growing in the same soil: these differences he also observed in a large plantation near Macao. Dr. Hooker, in the Botanical Magazine, t. 3148, has given the characters of the two species. Thea viridis, which is the species figured, he describes as 'a large, strong-growing, almost hardy, plant, with spreading branches; its leaves three to five inches long, very broadly lanceolate, pale green, singularly waved, with the margin reflexed; the flowers large, solitary, mostly confined to the upper axil. These appear in autumn, six weeks or two months earlier than those of T. bohea, which is of smaller size, with remarkably erect stiff branches; leaves not above half or two-thirds the size of the former, perfectly flat, more coriaceous, of a dark green, bearing in the axils of numerous leaves two or three flowers, which are smaller, and have a slight fragrance; and are in perfection during winter. This plant cannot withstand the frosts of an English climate.'

"Mr. Reeves, whose opinions, from his long residence in China, and attention to subjects of natural history, are entitled to the greatest weight, is the most recent author who has referred to this subject; and he expresses his surprise 'that any person who has been in China, or, indeed, any one who has seen the difference in the colour of the infusions of black and green tea, could suppose for a moment that they were the produce of the same plant, differing only in the mode of curing; particularly as they do not grow in the neighbourhood of each other.' (*Loudon's Gard. Mag.*, vol. ix. p. 713). To this opinion, it will be seen, he still adheres, as in a letter with which I have been favoured, he informs me that he believes that the Thea viridis of the gardens is the plant from which the green tea of commerce is prepared, and that the plant which produces the black tea of commerce, as souchong, congou, &c. is not so common in England. Both may be seen in great perfection in the Messrs. Loddige's rich and extensive nursery-grounds at Hackney, where a green-tea plant has lived for many years in the open air. The first impression on seeing them, is that of surprise at their ever having been confounded; as nothing can be more distinct than the large, membranous, light green, wavy leaf, with large and irregular serratures, and straggling habit of the green-tea plant, from the smaller, flat, thick, and coriaceous, dark-green leaf, with small and even serratures, and erect port of the black tea. Both plants have been figured in Loddige's Bot. Cab. t. 226 and 227, and the characters well given, as also in the above extract from Dr. Hooker. I would only add, that the flowers, though commonly, are not always single in the axils of Thea viridis; and this, though earlier in flowering, is not so much so as described. The green tea being the hardier is cultivated, as we shall see, in the northern, and the black tea in the southern provinces of China. The former is the only kind cultivated in Japan, according to Siebold, and is that figured by Kæmpfer, Amœn. Exot., p. 607.

"Notwithstanding the above opinions, and the distinctness in the characters of the two species, as above given, there is an unaccountable discrepancy in the statements as to the plants which afford the green and black teas of commerce, especially as Dr. Abel, after giving his opinion that there were two species of tea-plant, mentions that 'from persons perfectly conversant with the Chinese method he learnt that either of the two plants will afford the black or green tea of the shops; but that the broad thin-leaved plant is preferred for making the green tea.' (Journ. to China, p. 222).

"This is in conformity with the information communicated to Dr. Hooker, and also with that originally given by Mr. Pigou (As. An. Reg. 1802), on the authority of a Chinese, who had been eight times in the bohea country, remaining there from four to six months each time, and who stated that 'bohea may be cured as hyson, and hyson as bohea.' To this Mr. Reeves replies in the letter to which I have alluded, that 'the Chinese manufacturers do not, and *they* say they cannot convert black tea into green, and *vice versa*, and this I believe to be true; indeed, the colour of the infusions is alone sufficient evidence.' The discrepancy in the information Mr. Reeves explains, by adding that 'there is a species of tea grown in the province of Canton of a pale-coloured leaf (occasionally mixed with congou tea, to make the tea imported under the name of bohea), and this tea can be coloured and made up to imitate various qualities of green tea, and large quantities are yearly thus made: but still it is only an appearance that can be given: the deception is detected as soon as it is put into water.' Owing, no doubt, to these mixtures is the difficulty in detecting the two kinds of leaf in the teas of commerce; but in good teas they may be distinctly recognized. Dr. Abel's information having been obtained from hearsay at Canton, most probably refers to the kind described by Mr. Reeves, as he most particularly distinguishes, and lays down on his map, the green and black tea districts; but arguing upon the correctness of the information he had obtained, concludes that the differences observed may be produced by a due management of the heat used in drying the plant. Mr. Millet's account, Mr. Reeves says, he himself knows refers to some of this tea.

"A very important consideration being to ascertain the climates in which the tea-plants are chiefly cultivated, it is necessary, in the first instance, to determine the extent over which they are distributed, before we can form any idea of the degree of heat and cold to which they are subjected. Dr. Abel states, that 'the green tea district in the province of Keang-nan is embraced between the 29th and 31st degrees of north latitude, and is situated on the north-western base of a ridge of mountains, which divides the provinces of Che-kiang and Keang-nan. The black tea district, in the province of Fokien, is contained within the 27th and the 28th degrees of north latitude, and is situated on the south-eastern declivities of a ridge of mountains, dividing the province of Fokien from that of Keang-see.' p. 223. Hence we perceive that the districts have both a north-western and a south-eastern aspect, and that Dr. Hooker's statement that the Thea viridis is able to withstand the greater degree of cold, is confirmed by the fact of the green teas being procured from the more northern latitudes. This has reference to the teas usually manufactured for foreign trade, and is conformable to the information given by Mr. Reeves (Bot. Mag. l. c.), who states that 'the black teas are chiefly grown in the N.W. corner of the province of Fokien, in about lat. 27 deg. 50 min., long. 1 deg. 30 min. E. of Peking, and the green tea in the southern part of Keang-nan province, about lat. 29 deg. 58 min., long. 2. deg. E. of Peking.' At Hwuy-chow-Foo in the latter, the greater proportion of hyson and twankay is manufactured, and the black teas at Gan-ki-hien in Fokien. By Mr. Reeves I am further informed, that in a Chinese Herbal, in which the plants used in medicine are described, tea is said to be produced (among other places to the northward of 31 deg.) in nine places in Hoo-Qwang, three places in Ho-Nan, one place in Shensi, and two places in Shan-tung; one of these latter, and the most northward of the whole, is Tang-chow-Foo, in 36 deg. 30 min. north lat. From Kæmpfer, Thunberg, and Siebold, we learn that the tea-plant is extensively cultivated in the islands which form the Japanese territory; and these extend from 30 to 41 deg. of north latitude. It is also cultivated in the southern province of Yunan, whence we learn from Du Halde and Sir G. Staunton, the tea is procured, which is made up into balls; and likewise at Ho-ping in the province of Quang-tung; Dr. Wallich further mentions, that it is also

cultivated in Cochin-china, as far south as 17 deg. of north latitude.

"But as from the information obtained by Sir G. Staunton, we learn that the tea-plant thrives best between 23½ deg. and 30 deg., and as the principal cultivation of the best teas for the foreign trade is between 27 deg. and 31 deg. of north latitude the space included between these forms a belt, which will serve as a criterion of the soil and climate best suited to this plant. With respect to the former, Dr. Abel gives the only precise information I have been able to obtain, and he states that from every account given of the tea-plant, it succeeds best on the sides of mountains, where there can be but little accumulation of vegetable mould. The plantations which he saw were always at some elevation above the plains, in a kind of gravelly soil, formed in some places by disintegrated sandstone, and in others by the debris of primitive rocks. A large and flourishing plantation of all the varieties of the plant brought together by Mr. Ball, the principal tea-inspector at Canton, is situated on an island close to Macao, in a loose gravelly soil, formed by the disintegration of large grained granite. 'Judging from specimens,' Dr. Abel continues, 'collected in our route through the province of Keang-nan, whence the green tea is procured, its rocks consist chiefly of sandstone, schistus, and granite. As to what may be the exact nature of the rocks of the black tea country in the province of Fokien, I have no precise information. But as the great ridge separating that province from Keang-si is a continuation of the one dividing the latter from Canton, it is perhaps legitimate to conclude, that their constituent rocks are the same; and that the hills and soil on the eastern are the same as we found them on the western side of the ridge, or that they are covered by a soil like that in which the Camellia flourishes.' (Abel, p. 224). This is most likely to be the case, as Sir G. Staunton states that a chain of granite mountains begins at Hangchoo-foo, with a direction to the southward, and that vast tracts of hilly land are planted with tea in the province of Fokien. Mr. Reeves, from the views he has of Soo-Ei-Shan, where the best black teas are grown, suspects that the hills are schistose.

"With regard to the climate of this tract of country, or that best suited to the cultivation of the tea-plants, we are without precise information, as no one competent to make observations has resided throughout the year in the principal tea districts; but the approximative results we are able to obtain will, perhaps, be sufficient for practical purposes, particularly if connected with a view of the vegetation. In the first place, if we look at the tables which have been calculated, and those of Mr. Harvey are the latest, we shall find the probable mean temperatures of Canton, of the parallels of latitude of 29 deg. and of 31 deg., as well as of Pekin, to be 74.73 deg.; 72.62 deg.; 69.86 deg.; and 62.43 deg. respectively. But it is desirable to have these theoretical results confirmed by practical observations, especially as temperature is not invariably found to go along with latitude, particularly with regard to the eastern and western sides of continents. This the illustrious Humboldt has long ago shewn in his paper on Isothermal lines: where he has remarked that 'the whole of Europe, compared with the eastern and western parts of America and Asia, has an insular climate, and upon the same isothermal line, the summer becomes warmer, and the winters colder, in proportion as we advance from the meridian of Mont Blanc towards the east or the west; the western parts of all continents are not only warmer at equal latitudes than the eastern, but even in the zones of equal annual temperature, the winters are more rigorous, and the summers hotter on the eastern, than upon the western coasts of the two continents. The northern part of China, like the Atlantic region of the United States, exhibits excessive climates (as Buffon indicated) and seasons strongly contrasted, while the coasts of New California and the embouchure of the Columbia, have winters and summers almost equally temperate. Thus we find at New York, the summer of Rome and the winter of Copenhagen; at Quebec, the summer of Paris and the winter of Petersburgh. In China, at Pekin, for example, where the mean temperature of the year is that of the coasts of Brittany, the scorching heats of summer are greater than in Cairo, and the winters as rigorous as at Upsal.' These results have been deduced by their illustrious author from the observations of Amyot, which were carried on for a period of six years: by these it appears that Pekin, in N. lat. 39 deg. 54 min. and E. long. 116 deg. 27 min., and at the level of the ocean, has an annual mean temperature of 54 deg. 9 min., that of the warmest month being 84 deg. 38 min., and of the coldest 24 deg. 62 min.; while the mean temperature of the three winter months is 26 deg. 42 min. The severity of the cold may be judged of by this, and by the thermometer sometimes falling, it is said, as low as 63 deg. below zero, as well as by the great thickness of the ice with which the rivers are frozen over. The summer is as warm as that at Naples, with a mean temperature of 82 deg. 58 min., and the greatest heat as high, it is said, as 121 deg. The mean temperature of the three spring months is 56.30 deg., and of those of autumn 54.32 deg., but it frequently freezes in both March and November; the mean temperature, however, of seven months is above 51.8 deg., or that of the months in which trees vegetate that lose their foliage. The temperature of the spring months being of March 41.4 deg., of April 57.0 deg., of May 70.3 deg., and of June 84.2 deg.: the increase of the vernal temperature and the differences between these four months are seen to be very great, and very equal (15.7 deg., 13.3 deg., and 13.9 deg.) as characteristic of climates where the division of the annual heat between the seasons is very unequal. (Humboldt on Isothermal lines. Brewst. Journal, vol. iii. iv.)

"In some works it is stated that there are properly only two seasons at Pekin, summer and winter, or the seasons of snow and rain. The months of June, July, and August, are stated to be very rainy, and the average of rainy days to be fifty-eight. The climate of the northern provinces must, however, be considered a dry one, as we learn, from both Sir G. Staunton and Dr. Abel, that large stacks of salt are left in the open air, on the banks of the Pei-ho, covered only by bamboo matting under a coating of clay. The showers are described as being light; no indications of a damp atmosphere are mentioned, but heavy dews occur in the evening. The season in which China was visited by Lord Macartney's embassy was peculiarly dry, as it is mentioned that from July to November scarcely a shower had fallen, and the country had been traversed from Zhehol to 30 deg. of N. latitude. Lord Amhert's embassy also, which arrived on the Pei-ho on the 12th of August, had hardly any rain until the beginning of November, when they had got into the tea country. Le Compte also mentions a drought which had continued for five months in the year he arrived in China. The foregoing view of the climate of Pekin, though more severe than what the tea-plant is subjected to, will serve as an approach to a true estimate of the extremes of temperature which it is capable of bearing, as it is cultivated in 36½ deg. north, and also in Japan.

"As an indication of a southern climate where the tea-plant is cultivated, and the only one of which we have any account, it will be useful to refer to the following view of the climate of Canton furnished by Mr. Reeves to Dr. Lindley. I have deduced the mean temperatures from the maxima and minima; the results, therefore, though somewhat too low, cannot be very far from the truth. The range of the thermometer, and its means in the several months at Canton, are: in

| | Jan. | Feb. | Mar. | Apr. | May. | June. | | |
|---|---|---|---|---|---|---|---|---|
| Maxima | 74 | 78 | 82 | 86 | 88 | 90 | | |
| Minima | 29 | 38 | 44 | 55 | 64 | 74 | | |
| Means | 51.5 | 58 | 63 | 70.5 | 76 | 82 | | |
| | July. | Aug. | Sept. | Oct. | Nov. | Dec. | | |
| Maxima | 94 | 90 | 88 | 85 | 80 | 70 | | |
| Minima | 79 | 75 | 70 | 57 | 40 | 45 | | |
| Means | 86.5 | 82.5 | 79 | 71 | 60 | 57.5 | 69.7 | Mean annual temperature. |

"The cold weather months, or from November to February, are fine, dry, and bracing, with a range of the thermometer from noon to night of 10 deg. and 20 deg., the prevailing winds being N. and N.E. February is cold and rainy, March warm and foggy. In April and May the weather is warm, but pleasant, with variable winds, chiefly from the S. and S.E. In June and July there are often heavy showers with thunder, lightning, and occasionally typhons. During these two months and in August, the thermometer attains its highest elevation, but seldom exceeds 90 deg. The heat, however, is very oppressive to many; for at the latter part of this period, when the wind is westerly, there is little variation of the thermometer night or day, a sufficient indication of the moisture of the climate during this season.

"It would be desirable to know the quantity of rain which falls, but the only register that I have met with is one kept at Macao, and appended to the above thermometrical register of Canton. The climate is much the same in the two places, with the exception of a much smaller range of the thermometer at Macao, as might be expected in an insular climate; for though the heats are nearly as great in the warm months, the fall of the thermometer at night and in winter is much less. The quantity of rain which falls at Macao, on an average of eighteen years, is about 69½ inches annually—107 inches is the largest, and 49 the smallest quantity which fell in any year. Some rain generally falls in almost every month, though comparatively little from November to March; about five inches in both April and October, and about ten inches in each of the months from May to September, both included. If we compare the climate of Canton with that of Calcutta, which is not a degree to the southward, we shall find that with a maximum temperature of 93.6 deg., 3.6 deg. above that recorded at Canton, the minimum is only 56.8 deg., being 27.8 deg. above that at Canton; and while the mean temperature of the latter is 69.7 deg. (74 deg. according to some), that at Calcutta is above 78 deg.

"But as a great part of China, with a portion of the tea districts, has been traversed by the two British embassies, it will be useful to refer to the thermometrical observations which were made, though only for a short period of the year. The only meteorological register saved from the shipwreck of the Alceste, was that kept by Dr. Lynn during Dr. Abel's illness, from the 8th September to the 24th November, that is, from Tiensing, near lat. 39 deg., to Nanchang-foo, about lat. 28 deg. 40 min., which is about the northern extent of the black tea, and the southern limit of the green-tea district. Previous to this, and while at Tung-chow, nearly in N. lat. 40 deg., Dr. Abel observes, that Fahrenheit's thermometer from 20th August to the 2d of September, frequently stood in the shade during the day at 88 deg., rose once to 93 deg., and never fell below 83 deg. In the night it generally fell to 72 deg. and 70 deg., and the weather felt chilly. From the above register, it appears that the range of the thermometer was: in the

| | Morning. | Noon. | Evening. |
|---|---|---|---|
| Province of Pechelee, from 8th to 15th September ..... | 65° to 70° | 77° to 82° | 76° to 80° |
| Province of Shantung, from 16th Sept. to 2d Oct. ..... | 54 — 64 | 72 — 80 | 66 — 77 |
| Province of Keangnan, from 3d to 18th Oct. | 54 — 65 | 65 — 76 | — 70 |
| Province of Keangnan, from 18th to end Oct. | 56 — 62 | 60 — 72 | |
| Province of Keangnan, Tea-plant first met with, from 2d Nov. to 13th ..... | 52 — 63 | 54 — 76 | |
| Province of Kiangsee, from 13th Nov. to 24th ..... | 44 — 62 | 50 — 58 | |

"If we compare the range of the thermometer in the two latter periods, or during the month of November, when the embassy passed from 31 deg. to 28 deg. 40 deg. of N. latitude, as before, with some place in India, we shall find that Saharunpore, in lat. 30 deg., and elevated 1,000 feet, approximates in climate during this month, as the thermometer ranges from 45 deg. to 55 deg. in the mornings, and from 60 deg. to 84 deg. at the hottest time of the day, which is always, at least, two hours after noon. If we suppose the decrease of temperature to be only equal to what takes place at Saharunpore, we shall have a mean temperature of 52 deg. in the coldest month, January; with the thermometer sometimes down to the freezing point, and ranging up to 65 deg. in the warmest part of the day: but the extremes we know must be greater from what takes place both at Canton and Pekin, on account of the eastern exposure of China. This is confirmed by Mr. Reeves, who informs me that 'snow has been on the ground for days together upon the green teas, and the manufacturers of the black tea complain of the coldness of their country at times.' With respect to moisture, we have seen that the largest proportion of rain falls at and near Canton, while the sun is in the neighbourhood of the tropic of Cancer; so that there may be said to be a rainy season there, though not so decidedly as in Bengal; and Mr. Reeves has known the black-tea manufacturers complain 'that their first picking (in May and June) often suffers from rain and cold easterly winds.'

"These few indications of the climate being premised, it would be interesting to connect with them a precise idea of the vegetation; but this is hardly attainable, as so little is known of the interior of China, from the want of competent observers of the localities of plants; but there is no doubt that the vegetation must differ in the northern and southern provinces, and also where these consist of elevated lands or of plain country. From Du Halde, and the progress of the British embassies through the provinces of Pe-che-lee, Shan-tung, and the northern portion of Kiang-nan, we learn that from Tien-sing nearly to Nankin, or from N. lat. 39 deg. to about N. lat. 32 deg., and in a S.E. direction to the termination of the grand canal at Hang-cheu-foo, the country consists of level and extensive alluvial plains, rich and highly cultivated; intersected by numerous rivers and canals, and covered in some places with extensive swamps and broad lakes. In the most northern parts of this tract, with many genera found in temperate and European climates, we find some plants which we should expect to find only in more southern latitudes, as Lagerstræmia indica, Ipomæa Quamoclit, Celosia cristata, Gomphrena globosa, species of Gynandropsis, Tribulus, Clerodendron, &c.; the lakes abounding with Nelumbium speciosum, Trapa bicornis, Pontederia vaginata, and others; while the fields are cultivated with rice, millet, cotton, sesasum and castor-oil plant. Sida tiliæfolia, referred by Dr. Roxburgh to S. abutilon, affords fibres for rope-making; and the gardens capsicums, gourds, melons, and water-melons, the egg-plant, yams, and sweet potatoes, with species of Soja, Dolichos, and Lablab, all of which are also cultivated in every part of the plains of India.

"As the two embassies separated at the great river Yang-tse-kiang, and both shortly afterwards met with hilly country, as well as with the tea-plant, it is necessary to notice both, and more in detail than we have done above. Lord Macartney's embassy found a chain of granite mountains extending southwards from Hang-cheu-foo, about lat. 30 deg. 20 min., on each side of the river Che-tang-chaung, along which they proceeded after issuing from the grand canal. Here they found the large-leafed chesnut, and the towering larch; the purple-leafed tallow-tree growing near, and the shining-leafed camphor-tree further from the water, with Thuya orientalis in the valleys. About lat. 29 deg. 40 min. the banks receded from the river, and were chiefly cultivated with sugar-cane in the neighbourhood of groves of orange-trees. About this part of the route they were supplied with grapes, oranges, apples, pears, chesnuts, walnuts, pomegranates, melons, and a kind of date, as well as the Chinese

fruits see-chee (Diospyros) and lee-chee (Euphoria). On the sides of the hills, pines were met with, and on the sides and tops of earthen embankments, dividing the gardens and groves of oranges, the tea-plant was first seen growing like a common shrub, and along with it the oil-plant or Camellia oleifera.

"Lord Amherst's embassy having taken the direct route to Canton, proceeded up the Yang-tse-kiang first to Nankin, and then along the sides of the Poyang lake, to Nan-chang-foo, where the two routes united. In the neighbourhood of Nankin they found the country become hilly, fir-trees were first seen, and the cultivation of the mulberry and tallow-trees with that of rice and cotton. Near that town Dr. Abel found Rosa Banksiana, Cotyledon spinosa, Hamamelis chinensis, and Ficus repens abundant, as well as Pinus chinensis (Pinus Massoniana, Abel), with Salisburia adiantifolia. Near Tatung, about lat. 31 deg., which they reached on the 2d of November, where the country was hilly and picturesque, the chief interest was owing to the plants. The tallow-tree was abundant, and the tea-plant was first seen; the barometer on the river stood about 30.13 deg.; but on the hills close to it five species of oak were found, among them Quercus densifolia and chinensis, dwarf chesnuts, and among the many ferns Pteris piloselloides. Much ginger was also grown here. A few days' further progress brought them to the confines of the province of Keang-see; near this they found the tea-plant cultivated on the hills, which also abounded with oaks and fir-trees; and near the banks of the river there was extensive cultivation of rice, cotton, and bamboos.

The province of Keang-see, which in its northern parts is flat, full of rivers and marshes, and in winter has a mean temperature of 60 deg. (Enc. Metrop. Art. China) the embassy traversed along the borders of the Poyang lake, of which the neighbourhood is hilly, and covered with plantations of oaks and firs, to which were now added Cunninghamia sinensis (Pinus lanceolate) and Abelia chinensis. There were considerable quantities of the tallow, varnish, and camphor-trees. At Nan-kang-foo, situated about lat. 29½ deg., at the foot of a lofty mountain, of which the top was covered with snow, which melted next day, pines were seen at the greatest elevation. The barometer on the river stood at about thirty inches, so that the neighbouring country must be about the level of the sea, and the banks were covered with rice, cotton, and bamboo, and with them were cultivated Arum esculentum and Arachis hypogæa. On the hills many ferns were found, as species of Adiantum, Asplenium, Aspidium, Blechnum, Davallia, Polypodium, Pteris, and Woodwardia; an Ilex allied to I. aquifolium, Pinus chinensis, several species of oak and the tallow and camphor trees.

"At Nan-chang-foo, the route of the two embassies becomes again united. From the 24th November to the 18th December Lord Amherst's embassy proceeded up the river Kankiang, which flows into the Poyang lake; the banks were chiefly composed of red sandstone, resting on granite; when low, cultivated with rice, sugar-cane, bamboo, camphor-tree, and a Ficus, much resembling the banyan tree; and when high, with the oil-bearing Camellia, or C. oleifera, which was first met with by Dr. Abel shortly after leaving Nang-chang-foo, bearing abundance of flowers in November, varying in height from six and eight feet to that of a moderate-sized cherry-tree, and flourishing best in a red sandy soil; deer, pheasants, and partridges were seen; and a woodcock at Quachow. The sugar-cane was observed ready to be cut down, and great fields of wheat were springing up. On the 6th December, Pinus chinensis and Cuninghamia sinensis were again met with; and on the 8th at Seechou, about lat. 26 deg., the tea-plant was found apparently wild; in the neighbourhood of Elæococcus verrucosus (Dryandra cordata) and Eugenia microphylla. Beyond this, were extensive plantations Camellia oleifera, where Eurya japonica was abundant.

"On the 20th December, they crossed the Meiling Mountain, which divides Keangsee from Quantung, where groves of fir-trees skirted their way; and a species of Prunus was seen in full flower at the top. On descending from this, they entered the province of Canton, which at first they found mountainous and barren, but shortly met with groves of Pinus chinensis, intermixed with Cunninghamia sinensis. The vegetation on the surface of the hills least decomposed, consisted of the species of Lycopodium, which resembles a tree in miniature. A few days after passing Chau-chou-fou, which is situated near the 25th parallel of latitude, they found the neighbourhood of their anchorage hilly, and very abundant in wild plants. Myrtus tomentosa was of great size, and very abundant, Smilax China, famed for its sudorific properties, scarcely less in quantity; with another species, like S. lanceolata. A Begonia, resembling B. grandis, was also found growing to the height of twenty feet; and a wild species of Camellia, which Dr. Abel considered to be probably a variety of C. oleifera; while the rocky banks of some small streams were covered with species of Marchantia and Jungermannia. Two Rhexias of doubtful species grew in the rocks, with several plants of questionable genera. (Abel, p. 199). Plantations of sugar-cane were frequent in this part of their route, as well as in the southern portion of the province of Kiang-see. As they approached Canton, groves of orange-trees, of bananas, and of the rose-apple, relieved extensive fields of rice. A great extent of this province towards the coasts consists of level plains, and though so near the tropic, the winters we have seen are severe; ice is sometimes formed, but snow does not fall: owing, however, to the general mildness of the climate, and the alternations of hot and cold months, two crops, as in India, are annually obtained; and sugar, rice, and cotton, cultivated, as well as an inferior kind of tea. The fruits consist of oranges and shaddocks, bananas, pine-apples, and jack-fruit; with those which are peculiar to China, as the lee-chee, lougan, wampee, &c.: grapes, pears, prunes, chesnuts, and peaches, are also found, but do not ripen well. In a garden near Canton, Dr. Abel found the Moutan Paeony, Camellias, Azalcas, and roses, with the black and green-tea plants, which he also saw in a plantation at Macao; as well as Vaccinium formosum, the tree like Lycopodium, and the dwarf elm. The province of Fokien, which is celebrated for the production of the best black tea, lies to the northward of the province of Canton, between the tropic of Cancer and 28 deg. of north latitude. It is mountainous, but warm and healthy. The mountains are terraced, and covered with firs: the cultivation consists of rice and sugar, and in the cold season of wheat; oranges, lee-chees, and longans are abundant.

"From the above few notices of the temperature and vegetation, though during only a portion of the year, in some of the provinces of China, we may perceive a considerable resemblance to what we have seen to be the characteristics of the Flora of India and its mountains: that is, considerable uniformity in these respects over an immense extent of plain country, and a rapid change from a tropical to a European vegetation, whenever we begin to ascend the mountains. But this is a more remarkable occurrence in China than in India, as its plains stretch into more northern latitudes, and the extremes of temperature between winter and summer, as well as the differences in this respect between the northern and southern provinces, is much greater than in India. But if we enter more particularly into details, we shall find that this resemblance in the vegetation and cultivation of different provinces with one another, and of all with India, is almost entirely confined to annuals. Such plants, cultivated in summer, are subjected everywhere to nearly similar degrees of heat; while those which constitute the winter crops, meet only with congenial cold. But the perennials of mountainous situations, as well as those of the northern provinces, being exposed alike to the severity of a Chinese winter and the heats of summer, which, though great, are excessive only for a short time, resemble the plants of northern latitudes, and such as are found on the slope of the Himalaya: belonging to such genera as Pinus, Taxus, Juniperus, Cupressus, Quercus, Betula, Populus, Salix, Celtis, Ulmus, Æsculus, Castanea, Morus, Fraxinus, Syringa, Tilia, Acer, Rhododendrum, Andromeda, Azalea, Rhus, Juglans, Pyrus, Prunus, Cratægus, Cydonia,

together with Berberis, Sambucus, Viburnum, Lonicera, Evonymus, Rhamnus, Ilex, and Staphylea; and among herbaceous plants, many Ranunculaceæ, Fumariaceæ, Cruciferæ, Caryophyleæ, Rosaceæ, Sempervivæ, Umbelliferæ, and Primulaceæ; as well as species belonging to the genera Viola, Erodium, Geranium, Hypericum, Ruta, Lythrum, Saxifraga, Chrysosplenium, Rubia, Galium, Linaria, Hyoseyamus, Statice, Plantago, Iris, Lilium, Allium, Convallaria, and Paris. With these genera are associated others, of which the species are most prevalent about the centre of the temperate zone, and to which great extremes of temperature may be supposed to be obnoxious, as Pistacia, Olea, Punica, Cereis, Nerium, Oleander, Papaver Somniferum and Rhoeas; and others, of which the species are chiefly diffused through tropical countries, as Melia, Diospyrus, Sterculia, Grewia, Zanthoxyium, Acacia, Tamarix, Indigofera, Lespedeza, Hedysarum; but of these only single species have in general been enumerated in the northern provinces of China, in the same way that we have seen species of the same genera, extending to the most northern parts of India, and ascending up the sides of the Himalaya within the thick covering of jungle and forest, when they could not exist in the moderate cold even of the open places of Northern India.

"But the great resemblance of the Flora of the mountains, and of the northern provinces of China and Japan, is to that of Europe, as may be inferred from the existence in each of the above genera and a number of the same species; as Humulus Lupulus, Chelidonium majus, Hyoseyamus niger, Hedera Helix, Lithospermum arvense. Thlaspi arvense, and Capsella Bursa Pastoris; with several others, which are likewise found in the mountains and north of India. But as the north of China forms the southern boundary of Tatary, which indeed terminates only at the range of mountains, over the vallies and across the ridges of which the great wall is built, we may expect to find in the province of Pe-chee-lee, many of the plants of the Tatarian and Siberian Regions, which are themselves nearly identical in genera, but distinct in species, in consequence of the greater dryness of the former: but all these have a considerable resemblance in being subjected to great dryness and great extremes of heat and cold. Hence we meet with many of the plants of Pallas, Ledebour, and others, as included by Bungé in his enumeration of the plants of China. (Mem. De l'Acad. Imp. des Sciences de St. Petersbourg). As for instance, Clematis angustifolia, Delphinium grandiflorum, Menispermum dauricum, Papaver nudicaule, Viola variegata, Amygdalus pedunculata, Potentilla supina, bifurca, soongorica, and fragarioides; with Astragalus adsurgens and melilotoides, and species of Caragana, Oxytropis, and Patrinia, which are characteristic of these regions; with many others, as Serratula centauroides, Aster tataricus, Scorzonera radiata, Apocynum, and Cynanchum sibiricum, Gentiana squarrosa, Convolvulus subvolubilis, Iris dichotoma, Lilium tenuifolium, and Asparagus maritimus. As Kunawur forms the western limit of the Tatarian region, we have some of the plants which extended into it from more northern latitudes, found also in this part of China, as Ranunculus salsuginosus, and Sysimbrium Sophia. And as some resemblance was shown to exist, in appearance at least, between the plants of Kunawur and those of Delhi, we have some of the genera of the latter in the province of Pe-che-lee, as Ailanthus, Lycium, and Salsola. Thunberg has long ago remarked, that in Japan the cold is great in winter, and the heat considerable in summer; and that its botany resembles that of the north of China: this is fully confirmed by a comparison of his Flora with Bungé's list. He at the same time alluded to the affinity with the Flora of Northern America: this may be seen in the prevalence of the genera Magnolia Illicium, and Gleditschia. Panax pseudo-ginseng, found by Dr. Wallich on Sheopore in Nepal, differs but little from the American P. quinquefolium, which is supposed to be the same as the plant yielding the Chinese ginseng; some species are identical, as Veronica virginica, Ribes Cynoshati, and Datura Stramonium; of which the last, as well as the genera Chaptalia and Ampelopsis, has been found in America, China, and the Himalayas. Between the two latter, however, the analogy in genera is the greatest; and even some species which were first discovered in the Himalayas are now enumerated in the Flora of China; as Evonymus mieranthus, Fraxinus floribunda, Rhamnus globosus (R. virgatus? Roxb.), and Convallaria cirrhifolia; while others, which were only known as Chinese and Japan plants, are found in abundance within the Himalayas, as Houttuynia cordata, Hovenia dulcis, Ophiopogon spicatus and japonicus, Kadsura japonica, Hastingia coccinea, Murraya exotica, Hypericum patulum, Spiræa callosa, Viola prionantha Bge, Loniecra japonica and chinensis, with Daphne cannabina, and many others.

"In conjunction with such genera as were first enumerated, it may excite surprise to see so many annuals and such cultivation as we expect to meet with only in tropical countries; but this is far from surprising, when we consider that the temperature of the summer months diminishes but little, and in some places rather increases with the latitude; as Bruce, in Abyssinia, found the climate on account of the rain 12 deg. cooler when the sun was over-head, than when 36 deg. distant to the southward. Thus, at Calcutta, the temperature of the three warmest months, April, May, and June, is 85.05 deg., and of the rainy months, July, August, and September, 82.83 deg.; at Benares, in N. lat. 25.18 deg., the mean temperature of the first period is 90.99 deg., and of the second 83.01 deg.; and at Saharunpore 84.3 deg. and 82.3; while at Canton, in the three warmest months, it is 83.6 deg., and at Pekin 82.58 deg.; while at the last, the temperature of no less than seven months, is above 51.8 deg. Hence we find the lakes in the northern as in the southern provinces, abounding with Nelumbium speciosum and Trapa bicornis, and like those of India with Euryale ferox, and species of Nymphæa, Pontederia, Sagittaria, Utricularia, Myriophyllum and Leersia. Saururus supplies the place of Aponogeton; Phrynium capitatum employed in making the excellent Calcutta mats, is found in both countries. Species of Scirpus, as in India, yield tuberous roots, which are used as food; and species of Typha, Acorus, Lemna, Ceratophyllum, and Menyanthes, and are found as in more northern latitudes; while in the plains of the northern provinces, as we have seen, many tropical plants occur. In the central provinces, as we learn from the list given by Sir G. Staunton of the plants found in Shan-tung and Kiang-nan; we have such tropical plants as Grislea tomentosa, Vitex negundo and trifolia, Biophytum sensitivum, Boerhaavia repanda; species of Jasminum, Clerodendrum, Justicia, Basella, Rottboellia, Anthistiria, Andropogon, and Cenchrus, with many of those beforementioned, as occurring in the most northern provinces. With these there is a mixture of European genera, such as exist also in the southern province of Canton, where species of Galium, Scabiosa, Lycium, Chelidonium, Saxifraga, Sedum, and Reseda, are stated as occurring by Loureiro. It may also be mentioned, that many of the same flowers are common to Indian and Chinese gardens, some of which may also be seen in the summer in gardens in Europe; while others which have been introduced from China, are now common in every part of India, as Chinese Aster, Dianthus, Iris, Pardanthus, and Justicia; with Lagerstræmia indica, Dracæna ferrea, Hypericum monogynum, Kerria Japonica, Hiptage obtusifolia, Olea fragrans, Thuya orientalis, &c.

"It is not surprising, therefore, that the cultivation of every part in the warm weather months, is, as we have seen it to be the case even in the most northern province, like that of India; to the list there given we have only to add sugar, and the mulberry for the silk-worm, to have a cultivation identical with that of India during the warm weather and rainy season. Irrigation supplies in China the want of a regular rainy season in the most northern provinces. The analogy is still greater, for at the termination of the rice and millet crop we find wheat, barley, buckwheat, peas, beans, lucern, and tobacco are grown. For we learn from Staunton and Abel, that as the Sorghum vulgare, the Jooar of India, and Kow-

leang, or tall corn of the Chinese, was cutting down in the northern, and sugar-cane in the southern provinces, wheat was seen springing up, and about two inches high, about the middle of October and November. Thunberg states, that it flowers in March; so that the crop must be gathered in, about the same time as in India, that is, about the end of March or beginning of April. Mr. Gutzlaff more specifically mentions the two crops, one of rice, and the other of wheat, in the cold season. That the accession of the cold weather is sudden we may infer from being informed by Mr. Bell, that on their arrival in China, near the great wall, they were supplied with water and musk-melons, and on the 6th of November, only a few days afterwards, they encountered a 'great fall of snow, and a cold frosty wind.' Mr. Gutzlaff also states, that the 9th of November, when in 40 deg. of lat., was a very pleasant day, but during the night the wind changed, and a strong northerly breeze began to blow, the cold was piercing, and in a few hours the rivers and creeks were frozen over. (Voy. to China, p. 147).

"That the perennials and the botany in general of the southern provinces is very distinct from what we have seen to characterise the central and northern provinces, with the exception of a few annual species of European genera, allowed to exist during the coolness of the winter months, we may learn from the writings of Loureiro and Roxburgh, the relations of travellers, and the plants which have been introduced into Europe. From these sources we learn the existence of a species of Nepenthes, near Macao, with numerous Scitamineæ, and tropical Epiphytal Orchideæ, several Palms, as the Cocoa, Areca, and Cane palms, together with species of Caryota, Rhapis, Chamærops and Tacca, in the most southern provinces; with Pandanus odoratissimus, and Cycas inermis. Aloexylon Agallochum, the Eagle wood of the ancients, and Aloes wood of the moderns, Baryxylum rufum, iron wood, with species of Canarium, Phyllanthus Emblica, and Guilandina Bonduc, are specimens of some of the trees. Laurus Cinnamomum, Camphora and Culilaban, affording camphor and cinnamon. Augia sinensis, Elæococus verrucosus, and Stillingie sebifera, yielding varnish, wood-oil, and vegetable tallow, are some of those affording useful products; while the fruits consist of pine-apples, papayas, guavas, custard-apples, and such as are mentioned at p. 118.

"The principal families to which the rest of the known plants of the southern provinces of China may be referred are, Dilleniaceæ, Anonaceæ, Malvaceæ, Aurantiaceæ, Sapindaceæ; tropical Leguminosæ, as Anagyris, Poinciana, Erythrina; Melastomaceæ, many tropical Rubiaceæ and Synantherеæ, Scrophularineæ, Verbenaceæ and Acanthaceæ, Laurinæ, Euphorbiaceæ, Urticeæ, Commelineæ, and tropical Gramineæ. Species of the genera Cocculus, Capparis, Helicteres, Hiptage, Agllaia, Cissus, Combretum, Quisqualis Marlea, Lawsonia, Nyrtus, Eugenia, Passiflora, Callicarpa, Cordia, Convolvulus, Argyreia (Lettsomia. Roxb.) Bignomia, Jasminum, Hoya, Ardisia, Sideroxylon, Tropis, Antidesma, Boehmeria, Basella, Begonia, Musa, Crinum, Philydrum, Aloe, Amaryllis, Asphodelus, Melanthium and Eriocaulon.

"If we compare this with the Flora of Southern India, we shall find that the same great features are common to both; and though the northern provinces of China are more European in their Flora than we any where meet with in the plains of India, yet do their lakes abound with the same plants, and their plains are covered with similar crops. But the Flora of the mountain, including that of the most northern parts of China, has an almost universal identity of genera with that found covering the elevated belt of the Himalaya. If we commence with the bases of these mountains, and pass successively through the several belts, and analogous to what takes place between the parallels of latitude of 40 and 45 deg., experience the rapid decrease of mean temperatures, and the quick succession of vegetable productions, we shall first find a vegetation similar to that of the southern provinces; with the agriculture of the banks of the canal, consisting of rice, millet, amaranth, and an esculent arum, with ginger, turmeric, a little cotton and sugar, at one season, succeeded by wheat, barley, and buckwheat, in the cold weather months, (v. p. 18), even the mountain rice, lauded by Loureiro, meets here with a congenial climate. Along with plaintains, oleander, and some of the orange tribe, and the various plants enumerated at p. 13, we meet with some which were long considered peculiar to China; as Marlea begonifolia, and Houttuynia cordata, with species of Chloranthus, Incarvillea, and Hiptage. At the foot of the mountains of Silhet we meet even with the Chinese fruit Longan and other species of Euphoria. In ascending we pass through different gradations of vegetation, until reaching the regions of the oaks, and rhododendrons, which is immediately succeeded by that of the pines, we meet in the mid region with a Flora which must approximate to that of the mountains of the central provinces of China; for here we find the Chinese genera Abelia and Eurya, together with Stauntonia, Cadsura, Hovenia, Ophiopogon, and Pardanthus, as well as Deutzia, first found in Japan, to which new species have been added by Bengé from the north of China, and by Dr. Wallich from the Himalayas. In Nepal the latter has also discovered Hovenia dulcis, Taxus nucifera, and species of the equally Chinese genera Camellia, Cleyera, Podocarpus, Raphiolepis, Photinia, and Eriobotrya. But it is in the midst of similar vegetation that the tea-plant is everywhere found; and as we have some of the very genera and species, which were first found in the tea-regions, they point out, that here it may most fitly be introduced. It cannot be a difficult task to transfer from one country to another a plant, which grows naturally and is cultivated extensively, in one which possesses so many of the plants which are common to the two, and not found elsewhere. Particularly when we consider that a tea-plant introduced from China by one of the triennial embassies, has lived for many years in the open air in Nepal, and was there seen ten feet high by Dr. Wallich."

The Aurantiaceæ is also a family presenting great popular interest, and possessing no small commercial importance.

We observe that the author still clings to what is called the *natural system*, and defends it on several grounds, in the fourth part now before us. In the first notice which our Journal took of his work, to be seen in the number for May last, the merits of such a system were discussed at some length; but as he pertinaciously attaches himself to it still, we have no desire to renew the dispute, unseemly in science as controversy must ever be, and we conclude our present notice, highly gratified with the information contributed by Mr. Royle regarding the botany of the East Indies.

## CULTIVATION OF ASPARAGUS IN FRANCE.

The part of the garden chosen for Asparagus, is that which is longest exposed to the rays of the sun, and least shaded. A pit is there dug five feet deep or so, and the mould taken from it is sifted, throwing out all stones even of the size of a filbert nut. The best parts of this mould is then laid aside for making up the beds. The materials of a bed are thus placed:—

6 inches of common dung-hill manure.
8 inches of turf.
6 inches of dung as before.
6 inches of sifted earth.
8 inches of turf.
6 inches of very rotten dung.
8 inches of the best earth.

The last layer of earth is then well mixed with the last of dung.

The part is now divided into beds five feet wide, by paths constructed of turf, two feet in breadth and one foot in thickness. The Asparagus is planted about the end of March, eighteen inches asunder. In planting, the bud or top of the

shoot is placed at the depth of an inch and a half in the ground, while the roots are spread out as wide as possible in the form of an umbrella. A small cut of stick is placed as a mark at each plant, as it is laid in the ground. As soon as the earth is settled and dry, a spadeful of fine sand is thrown on each plant, in the form of a mole hill. If the asparagus plants have begun to shoot before their transplantation, the young shoots are cut off, and the planting will, with these precautions, be equally successful, though it should be performed even as late as July. Should any of the plants originally inserted die, they may be also replaced at this season. They ought to be two years old when they are transplanted: they will even take at three, but at four they are apt to fail.

If it be necessary to buy asparagus plants for these beds, it is necessary to procure twice as many as are required. The best of course will be selected from these for planting, and the remainder should be placed in some remote situation of the prepared bed; but without separating the plants. Here they must first be covered with four inches of sand during summer, and as soon as the frost sets in, with six inches of dung after that.

The stems of the planted asparagus are cut down as soon as the frost commences, and close to the ground. The beds are then covered with six inches of dung, and four of sand. In March again the beds must be stirred with a fork, taking care not to approach so near to the plants as to derange them. Towards the end of April the plants which have died, may be replaced with the reserved ones above described.

In three years the largest plants will be fit for use. If the beds be sufficiently large to furnish a supply in this manner, the asparagus shoots should be cut as fast as they appear, otherwise they must be left till the quantity required has pushed forth, in which case, the variety in colour and size is not so taking in appearance. A knife is used in cutting them, by slipping it along the stem, till it reaches the bottom of the shoot where the cut is conveniently made, the knife being much in the form of a long bladed chisel. At the end of four years the great and small ones may be taken indiscriminately. The cutting should cease about the end of June.

At the beginning of winter, the stems are all cut away and the beds covered with dung and sand in the manner above described. If muddy sand from the sea shore can be procured for the several purposes already named, so much the better; but if it cannot, river sand may be used, and if that is not to be obtained, fine earth may be substituted. Such an asparagus bed as has been described will generally last thirty years: but if planted in such abundance as to require cutting only once in two years, half the bed being always in a state of reservation, it will last for a century. The turf used in making the beds should be very free from stones.

Care must be taken not to tread on the beds, and to prevent any such accident a plank should be used to step upon. The divisions which are formed of the beds by thick turf is intended to prevent the condensation of the earth below, in consequence of the necessary walking that is there. The turf ought to be renewed every three years, that the ground below may be stirred; and in applying the winter coat of manure, even these walks must be covered, otherwise the plants which grow near the walks will be much inferior to those in the middle of the beds.

## ON DAHLIAS.

The following observations on these plants are abridged from a long account by Joseph Sabine, Esq., to be found in the Transactions of the Horticultural Society of London. Dahlias, when introduced into this country, excited great and singular interest. Independently of the superior beauty and diversity of the flowers, they have added a particular ornament to our gardens at a season of the year when formerly they were very naked and tame. The merit, however, of first carefully attending to their cultivation belongs exclusively to the continental gardeners; so that persons visiting the continent from this country on the return of peace in 1814 were surprised with the splendour and the varieties of this genus.

Dahlias were named in honour of Dahl, a Swedish botanist, but they are natives of Mexico, where Baron Humboldt found them growing in sandy meadows many hundred feet above the level of the sea. Much confusion has been occasioned in the names of the various species by different botanists having divided the plants differently. But the names *superflua* and *frustranea*, by which the species are now distinguished, are terms that designate that part of the character of the plants which depends on the fertility or barrenness of the rays of the flowers. There can be little difficulty in distinguishing the two species by considering duly *all* the characters of each. The *superflua* or *purple* kind is more coarse and diffuse in its growth and habit; and the other more delicate and compact as well as more upright; the stems of the *frustranea* or *scarlet* are perfectly round, and though in most cases quite as tall as those of the other, are generally slighter, and are always much covered with a glaucous dew, resembling the bloom on a plum, and are never hairy or downy. The leaves of the *frustranea* are smaller, of a brighter green, and of a slighter texture than is observable in the *superflua*; and the portions of the leaves of this last are generally broader than those of the other species. The flowers also of the *frustranea* in plants of equal vigour and health are uniformly less than those of the *superflua*, and the florets of its disc, are more elevated above the level of the ray. Mons. de Candolle has also noted a difference in the roots of the two species, which will be very serviceable to distinguish them in winter. The tubers of the *superflua* are always closely united to the main stem, whilst those of the *frustranea* are more or less appended to it by short strings and fibres.

The progress of the increase of the varieties at present existing is curious. In the royal garden at Madrid they were a long time without any indications of change: and some years elapsed after they were spread through Europe before any extensive increase or variation took place. But in 1808 Count Lelieur began to direct his attention to the dahlias. Amongst the plants raised at St. Cloud he mentions three with double flowers—the purple, rose, and buff, as well as several striped and shaded single ones. It was to his liberality that the Horticultural Society was first indebted for their fine assemblage of dahlias. Other enlightened cultivators succeeded on the continent in producing improved kinds by cross impregnations of the stigmata of the florets. In our own country there was an early promise of great success, had a right plan of management in keeping the plants been hit upon.

The plants of the *superflua* species, Mr. Sabine observes, which are raised from seeds, vary extremely in the form of the leaves, and the appearances of the stems; but as these differences do not at all affect their beauty, it is unnecessary to notice them farther than that such variations led the early writers on the genus to separate this species into two. The varieties of the *superflua* with single and semi-double flowers are most numerous, for the collections in the principal nurseries round London consist of nearly 150 perhaps, with names, exclusive of unnamed ones, all of them being so different, yet possessed of such qualities as to be much sought after. The colour of the florets of the ray of the flower pass from the darkest purples through lighter shades, into various deep and lighter reds approaching to scarlet; and through pale purples and lilacs into what may be called buffs, becoming paler, until they arrive at different shades of yellow. It seems, with the exception of the white varieties, as if purple and pale yellow were at the extremities of the scale, though there may be exceptions even here. Mons. De Candolle, in his essay on the genus, says, probably we shall never see a blue one, since the variation is from purple to yellow. Blue and yellow he considers are the fundamental types of the colours of flowers, and that they mu-

tually exclude each other. But so numerous are the varieties of the *superflua*, that all speculation is vain on what new changes may be effected by cultivation.

The *frustranea* or scarlet species have not exhibited so many distinct varieties; but it may be remarked that this and the former species have been continually approaching to each other, and as some pains have been taken to disperse the pollen of the various flowers, it has been supposed that hybrid plants have been produced, though Mr. Sabine thinks they exhibit not more diversity of character than may be fairly supposed to have arisen from pure seeds of the *superflua*, which has run into such extraordinary varieties. He says there are unquestionably variations sufficient to destroy the accuracy of the specific characters of the two species; the branches of some of the varieties of the *superflua* are smooth, and covered with a glaucous bloom, and in some instances the florets of the ray are entirely destitute of stigmata.

The varieties are to be obtained from seeds, which should be gathered from those plants whose colour and character are most likely to please, always taking from the dwarf ones, where no preference exists on other accounts. Many of the seedlings will follow their parents, and therefore all will not be new varieties. The seeds are to be sown in March, or earlier, on heat; the young plants, if necessary, to be pricked out into pots or boxes, and kept under cover in warmth until the end of April, when they may be planted out where they are to remain, covering each plant for a time with an empty pot at night, to avoid the effects of spring frosts. The seedlings should be planted in rows, say three feet apart and two feet distant from each other, to allow room for an examination of the different varieties. They thrive best in rich loam, and should have a clear open space to grow in. They seem to suffer if planted often in the same place. The addition of some fresh soil may overcome this evil, if there be not space for the gardener to move their quarters. Wind damages them; therefore they should be carefully tied to stakes as they grow. The seedling plants thus managed will blow in July, and continue in perfection till autumn.

Until a seedling plant shows its flowers, there are no means of ascertaining its value. The proper time to judge of the flowers is in the morning, for the sun injures them. Those produced in summer are much more brilliant than such as appear later in the season; though from the quantity of flowers in September or October the show may be greater. In the selection of the varieties, fancy must be the guide as to colours; the disposition to blow freely, and the having short pedicles, on which the flower stands boldly and well expanded, must also be attended to. These qualities may be looked for particularly from compact plants. Where any particular variety is approved, an increase may be made by cuttings of the young shoots of the branches, as soon as the value of the variety has been discovered. These will readily strike in a moderate heat, under a hand-glass, and in a favourable season they will grow in plain earth under a glass; if well managed they will in either case form roots and tubers before autumn.

Soon after the leaves and young branches of the plants have been destroyed by the frost, they should be cut down: those left in the ground must be protected by heaps of dead leaves or tan. But it is advisable to raise them with their roots and tubers entire, retaining a small part of the stem. The chief point to be attended to in their preservation during winter, is to have them kept plump, yet not so as to be rotted by damp, or touched by frost. Any situation, therefore, where this can be effected will answer as well as potting each root; such as a cool floor in a fruit-room, covering them with sand or coal ashes. When thus covered, however, their crowns should be placed erect and exposed to the air. In spring the roots, if large, may be divided; each tuber having a bud will form a plant.

The roots thus preserved are to be put out when all danger of frost is over; but previously they must be potted in the green-house, the object being to bring them as forward as possible. When put out, they look best in a large mass, and some nicety is required to distribute them in the manner that will be most striking in the particular situation when in flower. The earliest flowers of such treated plants will appear in June. In the spring, another opportunity occurs of increasing, by cuttings, the known varieties which are there to be planted. It is proper to leave only a single stem to each plant, and these will blow in the same season, but a little later than their parents.

In general an abundant supply of water to the roots is not advisable, as it drives the plants into leaf and height, thus diminishing the flowering. Great heat is also unfavourable; and until the weather becomes somwhat more temperate than midsummers are frequently found to be in this country, the flower-buds do not open well, but go off. There has been a speculation on the utility of roots as food. Mr. Sabine has tasted them, and found the old tubers very hard, and the young ones more tender when boiled; but he does not believe that the addition of a good sauce will even make them palatable to be used, except as an object of curiosity. Their flavour was that of a weak aromatic character, resembling ginger, which was stronger in the coat than in the substance of the root, and without which they seemed to be perfectly insipid.

## ANGLESEY.

The short papers which we have begun to give of the rural economy of the various counties in the united empire cannot all be possessed of equal value. The leading characteristics of each, are not of the same nature, nor, as respects agriculture and gardening, or in any one of these departments, is every county capable of furnishing lessons worthy of general observance. Anglesey for instance, if we leave out of view its *mines*, which cannot well be considered in this periodical, is greatly behind, in every rural respect, to many other portions of Britain. Indeed the climate and the unsheltered state of the land interpose difficulties not to be surmounted, as compared with many districts; whilst the state of the inhabitants, their established customs and modes of thinking, with various other circumstances, throw such obstacles in the way of rural improvement, as to make it appear probable that Anglesea will long remain in the back ground.

If however we can find little that will directly instruct us, as regards our Journal, in this ancient seat of Druidical fame, it seems not beyond the scope of our province, or of these short county notices, that we endeavour to call public attention to certain deficiencies in rural policy and management; thus indirectly doing our best to be useful. Accordingly we proceed to name some of the obstacles to improvement, and to point out a few glaring errors in the general condition as well as some of the capabilities that distinguish this county.

As to these obstacles we follow the information which has been afforded by writers on the rural state of North Wales. Bleakness of exposure, owing to the want of fences and plantations, and the coal tax, are evils greatly to be deplored as respects Anglesey. Now it is to be observed, that the island was once called the *dark* or the *shady*, in allusion to its thick groves of wood. Yet it certainly is true, that trees will not thrive except they be planted, and here on a large scale. They must also be protected from the depredations of sheep and cattle. Quickset fences, which are so rare, would flourish under the protection of such plantations, and thus mutual aid would be propagated, that would extend to the fields of corn and pasture. For were it not the bleakness of the exposure, the soil of Anglesey is fertile.

The non-residence of proprietors, the want of mutual confidence between them and tenants, the overvaluing of land by strangers, who do it at something like a percentage upon the advance, have all been complained of as general evils in the island. It is no wonder that the want of capital should cha-

racterise the farmers under such circumstances, and that leases are in disrepute. It is in perfect accordance with the state of things that the cultivators of the soil should still adhere to many superstitious customs. We do not say that many farmers are not to be found in Anglesey, particularly of late years, who follow pretty close in the march of agricultural improvement; but the majority are and must be still, from the general influences and evils mentioned, little alive to advancement, or capable of finding their way in its course, though perceiving its necessity.

Is it matter of surprise, from what we have said, that a great part of Anglesey is disgraced by cottages that are truly the habitations of wretchedness? Now the farmers, although their intelligence and condition indicate clearly a county's advancement, only do so in conjunction with the cottagers; and although these may be of an inferior grade, when compare dwith the former, yet they ever bear a close and intelligible relation to their superiors: so that a better index cannot be found of rural prosperity and eminence, than is presented by this inferior but most useful class. Too many of these poor people have not a garden, nor so much as a *leek*, except it be bought or begged; so that they cannot illustrate the moral of the adage, "Famine never enters the house through the garden door."

The natural capabilities of Anglesey are not small. Its soil is moderately fertile: were it sheltered and inclosed properly, it would produce fine crops, even of wheat. As it is it grows more oats and barley than the consumption requires: and a number of horned cattle, sheep, and hogs, are annually sent over the Menai. The most valuable product of the island however, arises from the mines. The Parigs mine, for example, is the most abundant in copper ore of any in the known world. And the magnificent suspension bridge recently completed, thrown across the straits of Menai, together with a great road affording a facility of intercourse between London and Dublin, running in connection with this unrivalled bridge, must eventually lead to important changes in the wealth and economy of the county, so that again it may hold true, "that Anglesey is the mother of Wales, because, when other counties fail, she plentifully feedeth them with provision."

The extent of the county is about 271 square miles, or 174,000 acres. The number of inhabitants in 1821 were 46,000. From what has been said, it is clear that the general aspect of Anglesey must be naked and uninviting. There are no considerable hills and valleys to diversify the scenery. The climate is unhealthy in autumn by prevailing fogs, which subject the inhabitants to agues.

## GARDEN OPERATIONS FOR DECEMBER.

This month is sometimes so mild, that one is apt to call the weather unnatural and ominous; sometimes floods deluge the earth for weeks together; or again, it is not unfrequently bound by intense frost, and covered with deep snows. It is therefore clear, that no universal directions can within our limits be peremptorily given. The following, however, are applicable to the circumstances which are at the same time supposed.

### THE FLOWER GARDEN.

If the weather be not very frosty, let the gardener turn all his heaps of compost, digging every parcel, carefully breaking all clods, and throwing it up with a new surface. Then if the weather be dry, he may give every heap a sprinkling of water. In his gravel walks few weeds rise to trouble him; but it is fit to roll the walks firmly. The beds of ranunculuses, anemonies, and other choice flowers, require care. If snow should fall it will do them no harm; but frost and rain are equally destructive; they must therefore be defended by coverings, on either occasion. The consequence of severe frost, if they be left exposed to it, is evident, and that of rains, if violent, is perhaps, worse; for they not only by their immediate coldness and damp rot the roots, but if this evil should be escaped, the wetness of the ground will give the next frosts double power.

The careful gardener, who sees his present leisure and recollects the hurry of his business in the succeeding spring, will mark out all places where he can plant flowering shrubs, dig them up two spades deep, laying the earth in a ridge, and once in every week or so during winter, stirring and turning it afresh.

### THE GREENHOUSE.

The severity of the season will not generally allow the greenhouse plants to have much air now; but let there be no opportunity lost of giving them that advantage, when it can be done safely. Every evening the shutters on the outside of the window and doors should be closed in the worst weather, but when it is anything milder, the plants must be refreshed with air whenever the sun shines well upon the place. The difference between noon-day and night is very great in point of cold, even in the severest seasons; and the air of the hardest time of the day is very different when the sun shines, and when his influence is obscured. If the gardener should keep his greenhouse shut up for a considerable time together, in the same manner as it is necessary to do in the severest nights, he would see the destruction of the whole collection come on gradually; but even the first notice he received this way, would be so late, that a great deal of mischief would be past remedy. The leaves toward the extremities of the branches in several kinds would drop off; and by that time many more would have lost their hold, doomed to follow. The next stage of decay would be seen in these branches themselves. In time the contagion of these decayed leaves would extend itself through the whole place; so that even those plants whose principle of vegetation had been so strong as to resist the mischief at first, would perish at last. At the same time, if the extent of the building were perverted, by leaving the glasses too much open, a great part of the plants would be lost through the absolute cold; close attention therefore is necessary to guard against the two extremes.

A difference between a pure and foggy air is also very great. A thick fog is in winter almost as much to be feared as frost. Such an air, if let in for a few minutes, and then shut up in the greenhouse, may do more mischief in one night than any other accident. The plants now require less water of course than at other seasons, and nothing will more contribute to the damage they may receive from being kept too close, than the addition of that damp which the warmth of the air will raise from the wetted earth. Nothing will promote the decay of the extreme parts of branches, so much as heat, closeness, and moisture.

The stove is a thing that must be particularly guided: and the gardener must judge from the aspect of his plants how the air is to be heated. If they shoot too freely, let the fire be slackened; if they appear faint, let it be increased. It must also be closely watched, whether they require more or less water, and let none be used that has not stood a day and night in the stove, and give this but sparingly to those that most require it—such as the shrubs and plants of a firm structure; and scarcely any to the Cereus kinds. These have no leaves to lose, therefore there is less danger of their wanting moisture: but with regard to the others, as the heat of the air keeps them perspiring, they must be supplied proportionally at the root, otherwise they will be stripped one by one of their leaves. The woody kinds will require water most frequently, the herbaceous in a middling degree, and the succulent least. Those that require most should have it allowed them, not by an increase of the quantity, but by repeating it the oftener; and it will be for the advantage of the plants in general not to water too many at a time.

### NURSERY.

The earth above directed to be thrown up in ridges, that is intended for planting in February, should be broke and turned in a mild day, that the frost and winds may be received on a fresh surface. There is no season when a gap or breach in the fences of a nursery can be so injurious as at present, both as respects the cutting winds and vermin. Let all be kept secure,

and the young trees well supported by stakes, whilst their roots are preserved by covering the earth immediately around them. If the rains lodge in any part, cut drains to let them off. In winter a wet ground gives the frost too much power upon the roots, and in spring it makes the shrubs shoot too fast. The business in a nursery is to make the plants grow firm and sound, which will never be insured when the ground is not duly drained. The beds of seedlings, whether of the flower or tree kind, must be sheltered a little by some sort of covering, according to their nature, if the frost be severe.

### FRUIT GARDEN.

If the weather be open, there is no time when the spade can be used to more advantage, as respects fruit trees. The season is approaching for roots drawing nourishment, and those of trees do it sooner than many imagine; therefore let the earth, if possible, be now prepared to give way to their young fibres, and to supply them with proper juices. It is proper to dig up all the ground between the trees in an orchard a full spade deep, picking out the roots of weeds, breaking the clods, and afterwards a little soot may be sifted over the earth, and next a little pigeon dung. United to such operations, a free but judicious use of a bill and a saw among the branches will tend greatly to insure a good crop.

### KITCHEN GARDEN.

Look to the artichoke beds, lately covered with mould; if the frost threaten, let a little dry pease-haulm be scattered over them, and if wet lodges let it be carried off. In a mild day dig up some spot for a crop of peas and beans. Probably the best bean for this plantation is the Sandwich, and the hotspur pea is also a very proper sort for this early sowing. The mushroom beds require good care now, and will repay it. Heat and moisture principally promote the growth of the spawn; but if either of these be in too great a degree, they will fail in their operations. Much wet will drown the whole, but a good covering of long straw will keep the seed from frost and rain; this must be dry when laid on, and removed when it grows damp and falls, to be anew supplied. The cauliflower plants under glasses are in all respects in the condition of green-house plants, so that the glasses must be let down in the evening to cover them close from the night frosts, but towards noon in a severe day they should always be opened. If any dead leaf appear upon them it must be taken off; the mould must be drawn up about their stems; and it will be of service to stir the surface a little within the glass frequently, and to dig it up round about it. Give air to the young salleting, for it will no more thrive on a hotbed kept close, than it will shoot now in the exposed ground. If the weather be tolerably mild, the several cabbage kinds may be planted for seed, selecting such as have the firmest and shortest stems.

Such are some of the garden operations which may properly fall within the month of December, though of course there are many other points and plants than we have enumerated that may call for attention. But a prudent application of the above rules may be very widely applied.

## METHOD OF DESTROYING ONE SORT OF THE GOOSEBERRY CATERPILLAR.

A GARDENER requires to know how to subdue the devouring hordes of insects which infest the sphere of his occupations. There is not a seed thrown, nor a plant put into the ground, but is liable to be destroyed by some kind of insect, reptile, or vermin. Many insects not only feed upon plants, but constantly lodge about them in one shape or another, producing distempers and failures in the vegetable kingdom, often imputed to other causes. Gooseberry caterpillars have long been a theme of complaint; numberless are the methods that have been adopted to overcome them; among which, we think, the following is one of the most sensible: and as it claims to be put into practice in winter, we insert an account of it at this season.

Of caterpillars there is one kind which goes into winter quarters precisely under the bushes whereon they were fed; and if any old dung or rotten leaves lay under the branches or about the roots, they resort thither. This fact, we are told, may be proved by watching particularly the progress of such creatures on some selected bushes. The inclemency of winter does not destroy them in the situation to which they naturally resort. In the course, therefore, of the winter months, pare all the earth from under the bushes, to the depth of about three inches, turning it into a flat ridge betwixt the rows. On the first dry day afterwards, tread, beat, or roll the ridges, and trench the whole down one and a half or two spades deep, observing to tread the foul earth into the bottom of the trench.

From what has been asserted of the winter habitations of these insects, gooseberry bushes should not be planted beside box-edged walks, flower-borders, or rows of strawberries. The season of the caterpillar's destructive reign is from the end of March to the month of June, when cold easterly winds prevail, which seems to cause the fly to take shelter under the young foliage. Hence arose the ancient notion that they were brought by the east wind.

## MODE OF PROTECTING FRUIT TREES FROM HARES AND RABBITS.

TAKE hog's-lard and as much whale-oil as will work it up to a thin paste or paint. With this gently rub the stems of the trees upwards, at the fall of the leaf. This has been found effectually to prevent these animals from touching such trees for a longer term even than the ensuing winter. The nature of the ingredients are perfectly innocent, in so far as the trees are concerned: and the ease with which they may be procured speaks for itself.

## ALDERNEY CATTLE.

THE island of Alderney is famous for its excellent breed of Cows. But they are in England only to be met with about the seats of the nobility and gentry, on account of their giving exceedingly rich milk, though small in quantity. The race, however, is so delicate and tender ever to be much attended to by our British farmers, for they are not able to bear the cold of England, particularly of its northern parts. They are very fine boned in general, but at the same time are ill shaped. Their horns are crumpled, and their size diminutive. Their colour is light red or yellow, and their beef generally yellow or very high-coloured, fine in grain and well-flavoured. They make themselves very fat, and Mr. Culley says, he never remembers seeing one of them in the least subject to lyer or black fleshed. He adds, that he has seen some very useful cattle bred from a cross between an Alderney cow and a short-horned bull.

We may advantageously follow up this short description of Alderney cows, with a remark on the breeding of cattle, which is confirmed, we believe, by the experience of every one acquainted with the subject. It is a great mistake to endeavour to unite great milkers with quick feeders. The consequence of such an attempt is to get neither sort, as an offspring, in any perfection. If the dairy-man wants milk, let him seek after the milking tribe, both bull and cows, of the best family. The quickest feeders, and those that have the finest flesh, must alone be procured by those who seek after the other class. It has been owing greatly to carelessness in the union of distinct kinds, that so much difficulty frequently occurs in distinguishing the most valuable of either class. The general rule is, that a cow which runs too much to flesh is not a good milker, for the great milkers are uniformly thin. There may be a middling kind of cows that give a tolerable quantity of milk, and also keep in pretty good order, but still such never possess the highest character for either quality.

1. Daphne cneorum.

2. Alyssum saxatile.

3. Lithospermum purpureo cæruleum.

4. Gazania rigens.

5. Nierembergia phœnicea.

6. Tetragonolobus siliquosus.

7. Polygonatum multiflorum.

8. Dianthus plumarius.

## DAPHNE CNEORUM.

TRAILING DAPHNE.

Class—Octandria. Order—Digynia.

Nat. Ord.—Thymelææ.

Gen. Char.—Corolla four cleft; drupe one seeded.

Spec. Char.—Flowers fascicled, terminal, sessile; leaves lanceolate, naked, mucronate.

This charming little shrub is a native of Switzerland and Austria; growing in such abundance on many of the mountains near Vienna that women gather it when in flower and sell it in the markets. Its beautiful and fragrant blossoms come forth in April and May, the principal season for its flowering, but it frequently blows during most of the summer, and even in autumn.

It is extremely hardy, and should be planted wholly or in part in vegetable moulds, and should never be unnecessarily removed, or any attempts made to thwart its natural habit of creeping, by supporting the branches off the earth. Thus treated, the daphne-cneorum will luxuriate and spread in every direction, and in spring will exhibit its beauty, emblazoning the earth, and surpassing every shrub of similar habit or magnitude that may rival its claim to admiration.

## ALYSSUM SAXATILE.

ROCK MADWORT OR YELLOW ALYSSUM.

Class.—Tetradynamia.——Order.—Siliculosa.

Natural Order.—Cruciferæ.

Gen. Char.—Silicle orbicular or elliptical, with valves flat or convex in centre; Seeds 2-4 in each cell; Calix equal at base; Petals entire; some of the stamens toothed.

Spec. Char.—Stem half shrubby at base, subcorymbose; leaves lanceolate entire downy; Pods obovate, orbicular, 2 seeded: Seeds edged.

As this plant has very generally obtained in gardens and nurseries the name of yellow Alyssum, we have retained it; for though it is not the only one of the genus which produces yellow flowers, it may still be called yellow by way of eminence, such is the extreme brilliancy and profusion of its blossoms.

Although not generally more than a foot in height, its branches spread, and generally much exceed that length, on account of the trailing position that they assume near the root.

It begins to flower about the latter end of April, and continues to blossom through great part of May; and it is not unusual for it again to assume its vernal beauty in Autumn.

If it has a pure air and a dry situation, it will grow in almost any soil. The usual way of propagating it is by slips, or cuttings.

As it is a small shewy, hardy plant, and not disposed to overrun others, it is very suitable to embellish rock work. Is a native of Crete, and was first introduced to this country in 1731.

## LITHOSPERMUM PURPUREO CÆRULEUM.

PURPLE AND BLUE GROMWELL.

Class.—Pentandria.——Order.—Monogynia.

Natural Order.—Borragineæ.

Gen. Char.—Calyx 5 parted persistent; Corolla funnel shaped, with a half 5 cleft obtuse limb, and an open orifice; Anthers included; Stigma obtuse, bifid; Seeds 4, hard, smooth, closed at the base.

Spec. Char.—Leaves lanceolate, acute at each end; Stem herbaceous; Corolla much longer than Calyx; seeds smooth.

This is one amongst the prettiest native plants of which England can boast. Its changeable hue, and the brightness of its fine blue tints, when fully expanded, render it particularly attractive. The long woody perennial root produces many round, hairy, leafy stems, most of which are procumbent, and throw out roots: the flowering ones only are perfectly erect, and about 12 or 18 inches high. The leaves are numerous, and clothed with short close pressed bristles. The beautiful flowers appear in April or May, standing erect in a sort of double leafy spike, whose extremities are a little curved downwards before flowering. It rarely produces many seeds, like most plants that increase much by the roots they are frequently abortive. The seeds are singularly hard, glossy and grey, like polished marble.

It grows freely in a light soil, mixed with old mortar, and may be increased by its trailing stems being turned back, and hooked down as layers.

## GAZANIA RIGENS.

RIGID GAZANIA.

Class.—Syngenesia.——Order.—Frustranea.

Natural Order.—Compositæ.

Gen. Char.—Receptacle naked or alveolote; Pericarps very villous; Pappus hairy paleaceous; Involucrum 1 leaved, the tube naked or covered with imbricated leaflets.

Spec. Char.—Leaves lanceolate, spatulate, and pinnatifid entire, white with down beneath; Peduncle 1 headed, terminal.

The greenhouse to which this splendid little plant properly belongs, can scarcely boast a more shewy plant; its blossoms, when expanded by the heat of the sun, (and it is only when the sun shines on them that they are fully expanded,) exhibit an unrivalled brilliance of appearance.

It flowers in June, but rarely brings its seeds to perfection in this country, which is of the less consequence, as the plant is readily increased by cuttings, which require to be placed under a hand-glass in a cool border, and when rooted, to put them in a sandy compost, and to be protected by a cold frame during winter. These may be transplanted into the borders of the flower garden in May. Native of the Cape of Good Hope, and introduced here in 1755.

## NIEREMBERGIA PHŒNICEA.

PURPLE NIEREMBERGIA.

Pentandria Monogynia.

Nat. Ord.—Solaneæ.

Gen. Char.—Corolla infundibuliform, five-lobed. Style dilated upwards. Stigma orbicular, marked with a transverse line. Capsule two-celled. Dissepiment parallel with the valves. Seeds studded with numerous raised points arranged in lines.

Spec. Char.—Leaves ovate, lanceolate, alternate, rarely opposite; flowers axillar, solitary; Calyx deeply five-partite; corolla broadly infundibuliform; lobes entire.

When trained against a wall, this species so extends itself as soon to cover a space of more than forty square feet, exhibiting at one time above three hundred beautiful and richly-coloured purple flowers; few plants, therefore, afford a more numerous display than the Nierembergia phenicia.

It may be increased by seeds sown early in spring on a hot-bed.

## TETRAGONOBULUS SILIQUOSUS.

SQUARE-PODDED WINGED PEA.

Class—Diadelphia. Order—Decandria.

Nat. Ord.—Leguminosæ.

Gen. Char.—Alæ of the corolla covering by their upper edge; filaments dilated upwards; legume square with four wings.

Spec. Char.—Pods solitary; stems procumbent; leaves downy beneath.

In this species the stems spread from the root, on the surface of the soil, they are about a foot in length, clothed with a white pubescence. The extreme ends of the shoots and lateral branches are raised from four to six inches high, producing their large pale yellow flowers through several successive weeks. The pods are coriaceous and four-angled. It is peculiarly well calculated for reclining on stones or spar, where it is shown to the greatest advantage.

It flowers in July and August, and may be increased by seeds, which should be sown early in April, upon an open bed or border exposed to the sun, where the plants are to remain: when they come up they must be thinned, leaving them near

two feet asunder, and afterwards they must be kept clean from weeds, which is all the culture they require.

Native of the south of Europe, and was first introduced to our gardens in 1683.

## POLYGONATUM MULTIFLORUM.

MANY-FLOWERED SOLOMON'S SEALS.

Class.—Hexandria.——Order.—Monogynia.

Gen. Char.—Flower 6 cleft, cylindrical; Filaments inserted into the top of the tube; Berry globose, 3-celled with 2-seeded cells; Flowers axillary.

Spec. Char.—Leaves alternate stem clasping; Stem round; Peduncles axillary many flowered.

A native of woods and thickets in various parts of England, though not very common. It is often met with in country gardens, and will even bear the smoke of London. It is perennial, flowering in May or early in June, and is admirably adapted to the filling up a damp and shady corner, where but few others will thrive.

The roots are fleshy, creeping horizontally, and are said by Linnæus to be often made into bread by the hardy inhabitants of Sweden. The stems are annual, a foot or more in height. The leaves are elliptical, each of these towards the middle part of the stem, bearing from their bosoms a branched flower, of a whitish colour tipped with green, very slightly downy at the summit, with a faint smell of bitter almonds. The berries are red; they are rarely produced, the plant increasing so much by the root. The unripe germen has a sweetish taste, like green peas.

In speaking of its virtues, Gerard writes, not very gallantly, that the bruised roots takes away "blacke or blew spots gotten by falls, womens' wilfulness in stumbling vpon their hastie husband's fists or such like."

It may be increased by dividing the roots in spring or autumn, and planting them in a shady situation.

## DIANTHUS PLUMARIUS.

FEATHERED PINK.

Class—Decandria Digynia.

Nat. Ord.—Caryophylleæ.

Spec. Char.—Glaucous; stem 2-3 flowered; teeth blunt; bracte ovate; very short pointed; leaves linear, rough at edge.

This species is perennial, with the stem ascending, a foot or eighteen inches in height, and branched. The leaves are of a glaucons hue, very sharp at the end. Flowers 1-2, seldom 3, at the end of the branches; they possess a sweet scent. Calyx glaucous, green, longer than in the other species; petals large, light red or bright purple, sometimes white, with a circle of red; deeply jagged, having a red down at the base of the lamina or border. Anthers red. Capsule shorter in proportion than iu the other species.

It flowers from June to August, and is a native of Europe and North America: on rocks, mountain pastures, and dry woody places. Introduced in 1629.

Pinks are sometimes increased by layers, but the facility of propagation by pipings has nearly superseded the practice of laying them.

The best time for this is about the end of June, but will vary with the season. It should always be done immediately before or during bloom; or indeed so soon as the young shoots are of a sufficient length for the purpose; that is, to form pipings from two to three inches in length. Pipings are made by taking a branch of the pink, and immediately below the second or third joint from the top cut it off, and the piping will be readily disengaged from the bottom of the two leaves which form a sheath round it, leaving it clear. The leaves may be shortened, but it is unimportant. They should be planted in a shady situation, and the soil should be a rich light compost, three or four inches deep; if no rain falls it should be well soaked with water a few hours before they are planted. The pipings need not be planted at a greater distance than three inches square and about half an inch deep. The ground should then be closed very hard upon them, aud they must be well watered, and a hand-glass placed over them: the waterings must be rcpeated as oftcn as is found necessary, till they have taken root; after which they will require no other care than to keep them clear from weeds till autumn, when they should be transplanted to the borders of the flower garden, where they are to remain. During the growth of the pipings, remove the hand-glass for the space of ten minutes, daily, to givc the pipings air, shading them during the removal, if exposed to the rays of the sun; and at the same time, turning the hand-glass bottom upwards that its interior may be dried. When thc pipings begin to grow, air should be admitted under one side of the glass, to inure them gradually to the atmosphere.

## GENTIANA VERNA.

SPRING GENTIAN.

Tet—Pentandria Digynia.

Nat. Ord.—Gentianeæ.

G. corolla quinquefida infundibuliformé, foliis ovatis acutiusculis: radicalibus patentibus; caulinis majoribus. Willd. sp. pl. 1. p. 1342.

This very elegant plant is a native of this country, particularly of the forest of Teesdale, Durham, where it is known to the iuhabitants by the name of Spring Violet, as it copiously enamels that country at a time when no other flower enlivens the dreary scene.

The root is perennial, thread-shaped and creeping. Stems about an inch high, simple, single flowered, thickly clothed with leaves, which are more especially clustered in the lower part, and are of an ovate form, entirc, generally pointed.

The flower is terminal, solitary erect, large, of a most vivid blue colour. The whole herb is smooth, less bitter than most gentians, and from its beautiful appearance, deserving a place in every collection.

## ROSA SEMPERFLORENS.

EVER BLOWING ROSE, OR DARK CHINESE ROSE.

Icoysandria Polygynia.

Nat. Ord.—Rosaceæ.

Rosa semperflorens, fructibus oblongis pedunculisque hispidis caule petiolisque aculeato hispidis; foliis subternatis aculeatis. Willd. sp. pl. 2. p. 1078.

We are induced to consider this Rose, as one of the most desirable plants in point of ornament, ever introduced to this country, its flowers largc in proportion to the plant, are semi-double, and with great richness of colour, unite a most delightful fragrance; they blossom duriug the whole of the year; more sparingly indeed in the winter months; the shrub itself is more hardy than most green-house plants, and will grow in so small a compass of earth, that it may be reared almost in a cup; is kept with the least possible trouble, and propagated without difficulty by cuttings or suckers.

## STEVIA PURPUREA.

PURPLE STEVIA.

Syngenesia polygamia æqualis.

Nat. Ord.——Composite.

Gen. Char.—Recept. nudum: Pappaus paleaceus. cal cylindraceus, ex simplici foliorum seri. Spec. Char. Foliis. lanceolatis. trinervis, Canaliculatis corymob fastigiato.

A hardy perennial herb, native of Mexico. Flowering from July to September, but of no striking appearance. The stem is two feet high, inclined or spreading, round, leafy, its branches terminating in numerous small corymbose flowers, of a reddish hue. The leaves are rather more than an inch long, shining, dotted, and occasionally serrated towards the top.

9. Gentiana verna.

10. Rosa semperflorens.

11. Stevia purpurea.

12. Erythronium Americanum.

13. Calophyllum Inophyllum L.

14. Anisomeles ovata. Br.

## ERYTHRONIUM AMERICANUM.

YELLOW FLOWERD DOGS-TOOTHED VIOLET.

Hexandria Monogynia.

Nat. Ord.—Tulipaceæ.

Erythronium Americanum ; foliis lanceolato—ellipticis, mucrone condriplicato ; stylo clavato, sulcato-trigono, one stigmatoso triangulosæ subhiante intus glandulose pubescente terminato ; antheris luteis. Erythronium deno Canis ; foliis lanceolato obongis, flore flavescente, Michaux Flor. Bor.—Amer. 1. 198. Nec Linnei.

It is a hardy perennial, native of the colder parts of North America. The bulb is solid, about the size of a filbert, covered with membranous dark brown coats. The leaves are coriaceous, elegantly stained with liver-coloured blotches, and have a hooded termination, from the revolute edges of the point. The flower is deep yellow spotted with red. Anthers and pollen yellow.

## CALOPHYLLUM INOPHYLLUM.

SWEET-SCENTED CALOPHYLLUM.

Polyandria Monogynia.

Calophyllum Inophyllum ; foliis ovalibus. Willd. sp. pl. 2, p. 1159, Ponna. Rheed. Mal. 4 p. 79. t. 38. Rai. Hist. 1525. Bintangor maritima, Rumph. amb. 2, t. 71. Arbor indica, medicæ amplioribus foliis, Plunk. alm. 41. Inophyllum Burm. 130.

It grows to a large tree, with the trunk thick, covered with a blackish, cracked, almost scaly bark, and supporting a vast umbrageous head. The leaves are four or five inches long, and nearly three inches broad, shining, smooth on both sides, and remarkable for the numerous extremely fine parallel nerves, which Burman fancied to resemble the fibres of a muscle dissected longitudinally, and thence called it inophyllum.

The flowers are white and fragrant, the fruit very resinous or oily ; kernel at first sweet, afterwards bitter.

When the bark is wounded, there exudes a viscous, yellowish fluid, which thickens and hardens in the air. It is called green balsam, or balsam of the Virgin Mary, and is used as a vulnerary.

## ANISOMELES OVATA.

BROAD-LEAVED ANISOMELES.

Didynamia gymnospermia.

Nat. Ord.—Labiatæ.

A. foliis ovatis subcordatis crenatis, verticillis multifloris, bracteis linearibus, calycibus pilosis ; glandulis inconspicuis. Ait. Hort. Kew, Ed. 2, v. 3, p. 364. Marrubium odoratissimum betonicæ folio. Burm. Zeghs. 153 t. 71. f. 1.

The whole herb has a velvet-like softness, owing to its fine, short, soft, depressed hairs. The leaves sometimes vary much in size, shape, and serretures, but are oftener crenate than serrated ; whorls for the most part crowded into thick, portly, leafy spikes. The calyx is very curiously reticulated with copious transverse veins ; its teeth large, broad, and pungent. The upper lip of the corolla short. The seeds are beautifully polished, elliptical, and of a shining black.

This plant is a native of the East Indies, and is hardly ever preserved in the stoves, being an annual of no great beauty, however interesting to the curious botanist.

PLATE 55.

## PITCAIRNIA BROMELIÆFOLIA.

PINE-APPLE-LEAVED PITCAIRNIA.

Hexandria Monogynia.

Nat. Ord.—Bromeliaceæ.

Pitcairnia bromeliæfolia. P. floribus lexe racemosis, pedicelis calycem æquantibus, foliis inferne ciliato—spinosis. Pitcairnia bromeliæfolia. L'Herit. sert. angle. p. 7, t. 11. Swartz. Fl. Ind. Occid. 1. p. 580. hanc, illustr. t. 224. Pitcairnia bromiliæfolia. P. foliis ciliato spiniosis, pedunculis germinitusque glaberrimiso Ait. kew. 1, p. 401. Schnev. ie. fasc. 4. t. 11. Wild. Spec. 2, p. 10. Poir. Dict. Enc. 5, p. 534. Hepetis Angustifolia, Swartz. prod. 56.

An inhabitant of Jamaica, where it is said to grow on the shady sides of mountains, flowering in April and May.

The rachis of the raceme as well as the peduncles and corrolla are of a fine scarlet colour ; the latter is persistant changing to a greenish, and lastly to a brownish hue. The transparent scale at the inner base of each segment is of an ovate form, truncate at the top, crenate, attached by its back, while the edge and summit are free. Radical leaves from three to four feet long, scarcely an inch broad when flattened. Scape terminal, a foot high, many flowered.

Is is a very ornamental plant ; requires to be kept in the tan pit ; often seeds ; but is generally propagated by offsets.

END OF VOL. II.

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THE

# MAGAZINE OF BOTANY AND GARDENING,

## BRITISH AND FOREIGN.

## 1835.

*Elements of Practical Agriculture; comprehending the Cultivation of Plants, the Husbandry of the Domestic Animals, and the Economy of the Farm.* By D. Low, Esq., F.R.S.E., Professor of Agriculture in the University of Edinburgh. Edinburgh: printed for Bell & Bradfute. London: Ridgway & Sons; and James Duncan, 1834.

It will be seen by the above title that this work comprehends a great variety of matters connected with the cultivation of the soil, whether in larger or smaller portions; in short, whether belonging to what is understood by Agriculture or by Gardening. It is, no doubt, immediately directed to those whose calling falls under the most extensive of these two terms which we have now used in reference to the culture of the soil. But it is quite plain that what holds true of the subjects treated of on an extensive scale, cannot be inapplicable to a more limited one, when dealing with the same materials and elements. The two branches are sisters, and as such our journal frequently introduces them. At the same time, that portion of this thick volume, which must be supposed from its title to contain a vast variety of matter more directly bearing upon the gardener's department, shall be now referred to. Before doing so, it may be proper to state that the author is well known, not merely as a man of theorctic and scientific knowledge, but of real practical experience in rural affairs, as, indeed, his public situation intimates. We do not look upon the information he presents as in any degree remarkable, but for the care with which it has been collected and put together. This, however, is done in such a lucid manner as to entitle the work to the favour of every practical man, especially those beginning the study of rural affairs and the management of land.

The author's account of the nature and varieties of soils might very properly be introduced by us, but we can only afford room for small portions of his work, and therefore must glean where the handfuls most suitable for our grasp can be found. Speaking of manures he has the following observations:—

"In practice, our object is to produce certain kinds of crops; and certain kinds of plants, it is found, require a greater action of manures at particular stages of their growth than others. Thus, the turnip, the carrot, and the beet, which are sown, as will afterwards be seen, in the early part of summer, require that the manure applied shall be in such a state of decomposition as to act upon and nourish them in the first stages of their growth; and if this be not so, the crop may entirely fail. In these and similar cases, accordingly, a complete preparation of the farm-yard dung is an essential point of practice.

"Certain plants, again, do not require the same state of decomposition of the dung. Thus the potato requires less in the first stages of its growth than the turnip, and hence it is not necessary to subject the manure to be applied to the same degree of fermentation.

"In some cases, too, as in the process of the summer fallow, to be afterwards described, the manure is mixed with the soil some time before the seeds of the plants to be cultivated are sown. In such a case the manure undergoes the necessary fermentation in the soil itself, and does not require that previous preparation which, in the case of the turnip and some other plants, is required.

"But while no necessity exists for fermenting the matter of the farm-yard beyond the degree requisite for the special purpose intended, it is always a point of good practice to ferment it to that degree. In order to know when dung is sufficiently fermented for the particular use required, a very little practice and observation will suffice. When it is fully fermented, the long stems of straw which formerly matted it together, are in such a state of decomposition, that the parts can be readily separated by a fork. It is not necessary, in any case, that it be in that extreme state of decay in which we often see it used by gardeners, and when it can be cut by a spade like soft earth. Whenever farm-yard dung has been fermented to this degree, it has been kept beyond the proper time, and the management has been bad.

"The produce of the farm-yard will necessarily afford the chief part of the manure consumed upon farms which do not possess extraneous sources of supply. But besides the produce of the farm-yard, there are certain vegetable and animal substances which in their separate states may be applied to the manuring of land. An example of the application of vegetable substances, in this state, is when certain plants are allowed to come into flower, and are then ploughed down in their green state, and mixed with the matter of the soil. This is a practice derived from very ancient times, and is yet followed in Italy and other parts of Europe.

"Vegetable matter when thus covered by the soil in its green and succulent state, readily undergoes decomposition, and forms a very enriching substance. The practice, however, is chiefly suited to the warmer countries, where vegetation is very rapid, and even there it argues a somewhat low state of the art, and is not the best way for producing decomposing matter for manures. When we are able to raise green food of any kind, it is better that we apply it in the first place to the feeding of animals, for then it not only yields manure, but performs another and not less important purpose."

He enumerates a vast number of substances that may be employed as manures; but the law is of general application, as he states, that all animal as well as vegetable substances can he used for this purpose; and the province of the cultivator of land is sedulously to collect every substance of these kinds that comes within his reach, and if they do not admit of beneficial application in a separate state, to form them into a compost, or mingle them with the general mass of his manure.

When on the subject of plants cultivated for their seeds, the author gives directions as to the pickling of wheat, to prevent a disease to which the cultivated tritica are subject, called the *smut*.

"Let a tub be provided, and partly filled with urine, and let a quantity of wheat, as a bushel, be put in at a time. Let the wheat be well stirred, and all the lighter grains which come to

the top skimmed carefully off, and thrown aside as useless. The wheat should remain from five to ten minutes, but never more than ten minutes, in the pickle. The successive portions of wheat thus pickled are to be allowed to drain a little, and then to be laid upon the barn-floors in layers, hot lime being at the same time sifted upon each layer. The purpose of spreading the lime is to dry the grain, which should then be carried immediately to the fields and sown. The lime used should be quite hot, and for this purpose it should be slacked at the time. Although the immediate purpose served by the application of lime is drying the grain, it may be believed that it also assists the action of the brine in removing the tendency to the disease.

"A very strong pickle of salt dissolved in water may be used instead of urine; but salt-brine is not quite so secure a mean of destroying the infection of the disease as urine; and the latter, therefore, ought to be preferred.

"The wheat, after being pickled, must not remain long unsown, otherwise its vegetative powers may be injured or destroyed. No more should be pickled at a time than can be then sown. When from any cause, as from rain intervening, it is not practicable to sow the wheat for a day or two, it should be spread thinly upon the floor, but never kept in sacks, in which it would soon ferment."

Of the plants cultivated for their roots, tubers, and leaves, we quote what is said of the mode by which new varieties of the potato may be obtained.

"The mode of procuring new varieties from seeds is simple but tedious. Some of the largest and best-formed berries, when fully ripe, which is denoted by the change of their colour, and by the stalk having become withered, are plucked, and the pulp separated from the seeds, which are then dried in the sun, These seeds are to be sown in the following spring, and the produce to be taken up early in October. They will then have nearly attained the size of small plums. The best of these are to be selected and carefully preserved. In the month of April following they are to be planted at a distance from each other of from 15 or 18 inches; and when they rise about two inches above ground, they are to be covered with earth by the hoe, which operation may be repeated during the season, and they are to be kept free from weeds. When they have arrived at maturity, which will be denoted by the decay of the several stems, they are to be taken up in succession as they ripen, keeping the early separate from the late; and the produce of each stalk is again to be planted in the following spring. A judgment of the properties of the potatoes will then have been formed, and those are to be reserved for cultivation which are approved of. It will be found that, whatever had been the parent stock, the seeds will produce numerous varieties, some white, some dark in the colour, with tubers of different forms, round, oblong, and kidney-shaped. This is a tedious process, but necessary when it is desired to cultivate new varieties from seeds."

Many of the early potatoes do not blossom at all. Mr. Knight, we are told, adopted an expedient to obviate this. He removed the tubers as they were being formed, by which means he directed the vegetable juices to the stem and parts of fructification, and so was enabled to produce blossoms and seeds.

Of the parsnep we have a very fine character:

"The seeds of the parsnep may be sown either in autumn or in spring. The latter period is generally adopted, but the autumnal sowing is well suited to the habits of the plant.

"When it is to be cultivated in spring, the land intended for it is to be ploughed in autumn with a deep furrow. It is to be cross-ploughed in spring, and tilled and cleaned, in so far as the earliness of the season will allow; for the parsnep must be sown at an early season, the common period usually being the month of March.

"The parsnep may be sown on a flat surface, in rows, like the carrot, the plants being kept at a somewhat greater distance from each other. But sometimes the seeds are sown in beds in autumn, and transplanted when the soil is prepared.

"The parsnep might also be cultivated in drills precisely like the turnip and potato. Nay, this seems to be the best mode of raising it; because an increased deepness eminently favourable to the habits of the plant will be given to the soil. If cultivated in this manner, the drills may be no wider than is necessary to admit the horse-hoe, as 24 inches; and the plants may either be planted in the drills from previously sown beds, or the seeds sown in the manner of the turnip, and hoed out to a distance of eight or ten inches from each other. The method of transplanting would probably be the better, as in this case the plants would not need to be planted in drills till the month of April, when the land could be better prepared.

"All the after processes of tillage may be the same as for the carrot.

"The seeds must be new, because when they are more than one year old they frequently do not vegetate. The seeds are very light, but they do not adhere in the same manner as the seeds of the carrot, and hence are more easily sown.

"The parsnep has a wider range of soils than the carrot, and, unlike the carrot, seems to prefer those which are more or less clayey.

"The plant is ready for use when the leaves begin to decay. It may be taken up and stored like the carrot, or left in the ground to be pulled when repuired for use. It is not apt to be injured by frost; but it should not be left in the ground after the beginning of February, because, as soon as the flower-stalks begin to form, the roots become hard. The produce is generally greater than that of the carrot.

"Its uses for domestic purposes arewell known. It is a useful esculent for the garden of the cottager. When persons abstain from animal food, as in catholic countries, the parsnep is regarded as a grateful substitute. For this reason it is that it was formerly more cultivated in this country than now, to be eaten with salted fish during the season of Lent; and it is yet largely cultivated for the same purpose in the north of France and the Low Countries.

"All animals are fond of the parsnep. To milch cows it is eminently favourable, giving a flavour and richness to their milk which no other winter vegetable but the carrot can give. The cows of Jersey and Guernsey, fed with parsneps and hay, yield butter during winter of as fine a tinge, and nearly as good flavour as if they were fed in pastures. To horses it is equally suited as the carrot. Hogs are extremely fond of it: and, when boiled, poultry may be fed upon it.

"Like the carrot, it yields a large quantity of spirits by distillation.

"As a plant of agriculture, the parsnep seems to be better suited to general cultivation in the field than the carrot, as being more productive, and having a wider range of soils. At the same time, from the early period at which it must be sown, and from the difficulty of getting the land fully prepared for it in spring, it cannot be said to be a plant well adapted to field-culture in this country. It is, however, suited for being cultivated on the small scale, and in this view it is better deserving the attention of the cottage-gardener than other plants which have succeeded to it in common estimation."

We pass over the section devoted to plants cultivated for their fibres—those for their oils—those for their dyes—and those for their sugar. Of such as are cultivated for their narcotic principle, the poppy deserves to be honoured. That which is chiefly intended for this power is papaver somniferum. The opium poppy.

"The flowers of this species are sometimes white, when the seeds are also white; and sometimes the flowers are white and purple, when the seeds are of a darkish blue colour. The first is the variety *album*, the latter the variety *nigrum*, of De Candolle. The darkish coloured seeds are obtained from Germany, under the name of maw-seeds. This plant grows, in favourable

situations, to the height of five or six feet. The pedals of the flowers are of short duration, being succeeded by large round heads, somewhat flattened. It is from these heads or capsules that the opium is derived.

"Being an annual plant, the poppy, when sown in spring, matures its seed in autumn. It is of easy culture, and can be produced in the north of Europe, and the opium extracted from it.

"In England, the seeds may be sown in the beginning of March. The best method of cultivating the plant is in rows. But, on the poppies attaining a few inches in height, they are to be hoed out to a distance from each other of six or eight inches.

"When the heads are fully formed, but are yet green, the opium may be extracted. The process, although minute, is simple, and may be taught to children in an hour.

"Two or more longitudinal incisions are made in the capsule, with a sharp knife, or other instrument, about an inch in length, and not so deep as to penetrate through the capsule. The incisions are, in the first place, made on one side of the capsule only. As soon as the incisions are made, a milky juice will flow out, which, being glutinous, will adhere to the capsule. The next day it is collected from the capsule, by the edge of a knife or spoon, and put into a vessel. As soon as the glutinous matter is taken from one side of the capsule, the remaining incisions are made on the opposite side, and the same process of collecting the exuded juice is repeated.

"The juice thus collected is opium. In a day or two it is of the consistency to be worked up into a mass, and may be rolled up in leaves, like the opium of commerce.

"The narcotic matter of the plant may be also collected by boiling; but it is only the exuded juice that forms pure opium.

"The manner of cultivation described does not differ in principle from that practised in the opium-countries of the East. In these, according to writers, the longitudinal incisions are made at sunset, by many pointed knives or lancets. In the following day, the juice is collected, scraped off with a small iron scoop, and deposited in earthen pots, where it is worked by the hand until it becomes consistent. It is then formed into globular cakes, and laid in little earthen basins, to be further dried. After the opium is extracted from the capsule, the plant is allowed to stand and ripen its seeds.

"The seeds of the poppy, having nothing of the narcotic principle, are eaten by the nations of the East as a nourishing and grateful food; and they yield by expression an oil, which is regarded as inferior only to that of the olive.

"It is the expense of labour, and the contingency to which the plant is subject from rains, that form the principle objection to the cultivation of the poppy in this country for its opium. The latter objection, indeed, is greater than the first. The processes of labour, though minute, are simple, and can be performed by children. The trials, however, that have been made on the culture of the opium plant in this country, notwithstanding the partial success of some of them, lead to the conclusion that opium may be better obtained from countries with a warmer and less humid climate than that of England."

The simple manufacture of tar, under the head, "Plants cultivated for their resins and gums," is thus described:—

"From the wild pine, *Pinus sylvestris*, frequently called the Scotch fir, is obtained common tar. The manufacture is carried on in those vast countries of pine which form so great a part of northern Europe.

"The manufacture is simple. The conical hole, usually in the side of a bank, being made, roots and fillets of pine are let into the cavity, and the whole is covered with turf, which is beat firmly down above the wood. The wood being kindled, a slow combustion takes place. A cast-iron pan at the bottom of the cavity, receives the fluid, and has a spout which projects through the bank, and carries the tar into barrels. As quickly as the barrels are filled, they are closed with bungs, when the material is ready for exportation. This manner of preparing tar has been derived from the earliest ages. By the further application of heat, the tar is converted into pitch.

"These two substances, tar and pitch, are of extensive use in the arts. The employment of them in the preservation of the ropes and cordage of shipping, is everywhere known. The importation of tar into this country from the north of Europe and from America is very great. The tar of America, however, is not derived from the consumption of the wild pine, which does not exist in the new world, but from other species, and chiefly from the swamp pine, *Pinus australis*.

"The Norway spruce, *Abies communis*, is applied to the same purposes as the wild pine."

It hence appears that many of the coniferæ or fir-tribe are of the highest value, both on account of the timber which they produce, and their numerous secretions. Common turpentine is also extensively produced by the wild pine.

From what the author says under the title of "Plants cultivated for fermented or distilled liquors," we extract an account of the process pursued in making cider.

"The preparation of cider is a simple process. The apples being gathered, which must be done when they are thoroughly ripe, are piled into a heap about a foot high. This heap may be defended from the rain, but the air should be allowed access to it. After the fruit has lain for a time to mellow, all decayed apples being in the mean time removed, it is carried to the bruising-mill.

"This, in most of the cider countries of Europe, is a very simple machine, consisting merely of a common millstone, placed vertically, and made to be moved round in a circular stone-trough by a shaft extending beyond the trough, to which a horse is attached. The vertical millstone should be made of any hard stone, but not of limestone, because the malic acid of the fruit acts upon the calcareous matter; neither should any lead be employed.

"The vertical millstone may be four feet in diameter and 10 or 12 inches thick; the groove in which it is to run in the trough may be 9 or 10 inches deep, of sufficient breadth at the bottom to allow the stone to move freely, and 6 or 8 inches wider at the top than at the bottom. The apples are strewed in the trough, and crushed by the stone as it revolves.

"The pulpy mass being removed, is allowed to remain about twenty-four hours in a heap, after which it is carried to the cider-press. This is usually formed on the principle of a common screw-press. Boards placed horizontally compress the pulpy matter, and the screw which presses them together is moved by levers. The pulp is placed usually in hair bags, one above the other, between the horizontal boards. These are slightly compressed at first, and then more strongly until the juice be fully expressed. The juice is received in proper vessels, and after being pressed through a hair-seive to retain the grosser parts, it is conveyed to a cask, where it is suffered to ferment.

"The fermentative process proceeds, and when it is completed, the liquor is withdrawn, or racked, as it is termed, the impurities being left behind. Should the vinous juice show a disposition to ferment a second time, it must be again racked, and so on till the tendency to fermentation be removed. The cider now formed is put into the casks into which it is to remain. It is kept in these until it is fit for being put into bottles, when, if well made, it will be found to be a clear rich liquor, and will remain in these bottles, without loss of its properties, for twenty or thirty years. Cider, then, it appears, is a true wine, without any addition to the fermented juice of the fruit.

"The manufacture of perry is entirely the same as that of cider, the pear being substituted for the apple."

Of plants, for their domestic uses, how can we forget the tea and coffee kinds? But the incredulity of purchasers respecting the honesty of tea-dealers is not likely to be lessened by what we now extract.

"Thea viridis, common tea, is now the subject of immense commerce. It is the leaves of this plant that are imported in such vast quantities, and the infusion of which forms something like a necessary of life in certain countries. China and Tartary supply tea in the largest quantity.

"The leaves of the tea-plant seem to owe their grateful action upon the system to their stimulant properties. Many substitutes have been used, and are mixed largely with the tea consumed in this country, but none of them possesses the properties of the tea-plant of Asia.

"The substitutes are the leaves of some of the plants of the rose family, as the rosa rubiginosa, sweet-brier, and rubus arcticus, common dwarf bramble; of some of the currant tribe, as ribes rubrum, black currant; of some of the almond tribe, as prunus spinosa, the sloe; of some of the mint family, as sage and balm; and of some of the heaths and ferns.

"The coffee-plant, coffea arabica, yields a berry whose decoction forms a well-known beverage, the use of which has been derived by us from Asia. Europe is now supplied in immense quantity with the berry of the coffee-plant from the islands of the West Indies. This decoction is, like that of the tea-plant, grateful to the palate, and produces an exciting action upon the system. Many substitutes have been used, but, though generally nutritive and wholesome, none of them possesses the flavour and propertics of the coffea arabica.

"The best of the substitutes for coffee are the seeds of certain leguminous plants, which may be prepared by roasting in the same manner as coffee. Two of these may be mentioned:

"1. Astragalus bœticus, Bœtian milk-vetch, a plant which is cultivated in several parts of Europe, and used in the same manner as coffee.

"2. Lotus tetragonolobus, purple-winged pea. This plant is cultivated in Spain for the like purpose. It produces beautiful scarlet flowers, and is remarkable for its winged legumes.

"But the plant which at present attracts the most attention, as a substitute for coffee, is the succory, cichorium intybus, which is also cultivated for forage. It is the root of the plant which is used. It is mixed largely with the coffee consumed in France. It is believed not greatly to injure the flavour of the coffee, and some even, from habit, prefer the mixture."

The author gives a great deal of practical and interesting information concerning plants cultivated for their wood. These are chiefly the fir-tribe, called soft-wood trees, and the other tribes, frequently termed hard-wood. We must close our notice of the volume, after extracting a long passage about the raising of such trees.

"Trees of either class may be raised directly from seeds in the places which they are to occupy; but experience shews that it is generally more convenient to raise them in some place where they can be tended with care during the first stages of their growth, and, when they have acquired sufficient strength and size, to transplant them to the places where they are finally to grow.

"In this country the care of the nursery has long become a distinct profession, and it is the natural effect of a division of labour that it should be so. Convenience will cause the greater number of planters to resort for their supplies of tree-plants to those who devote their attention to the raising of them. But, where planting is to be carried on upon an extended scale, the planter may form his own nursery, in which case he has the means of cultivating his trees with more economy, and on soils more similar to those on which they are to be ultimately cultivated.

"A nursery of this kind should consist of soil of a medium degree of fertility, the extreme of too great richness, or too great infertility, beiug avoided. The soil, too, should be of the lighter kind rather than of the stiffer, because the lighter soils are better suited than the stiffer to favour the growth of the roots of young plants, and because they are adapted to a greater diversity of the kinds of the cultivated trees.

"The situation of the nursery should be somewhat airy, without being too much exposed. To prepare the soil, it should be deeply trenched, and thoroughly cleaned of the roots of weeds. If the land be not of itself fertile, it should receive a moderate manuring of lime and dung; for, although every thing like forcing forward of the plants is to be avoided as a great error in practice, care is to be taken that the land shall possess a sufficient degree of fertility to nourish and bring them forward.

"The seeds of the trees to be cultivated are first sown in what are termed the seed-beds. These may be made about four feet wide, with little paths for passages between.

"The ground of these beds being carefully dug, and rendered smooth by the rake, and a little of the surface-soil being laid aside for the purpose of covering the seeds, these are to be scattered evenly over the surface, and a light wooden roller then passing over it, the carth, which had been laid aside, is to be spread carefully and equally over the seeds.

"The seeds of resinous trees must be lightly covered, and so also must some of the hard-wood kinds. Those of the larch, the Scotch or wild pine, and the spruce, should be covered about a quarter of an inch, and sown in the month of April; whilst those of the oak, the ash, the chestnut, the sycamore, and others, may be more deeply covered, and sown at an earlier season. But some of the hard-wood kinds require to be sown at a later period, on account of their being subject to injury from frost; and some may be sown in summer and autumn.

"The young plants remain in the seed-beds for one or two years, during which period they are termed seedlings. Some of the hardier resinous species, as the larch and the wild pine, may be transplantad at once from the seed-beds to the place which they are to occupy in the forest; whilst others, including several of the resinous, and all the hard-wood kinds, are first transplanted into lines in another part of the nursery, where they remain for one or more years, and then are transplanted to their place in the forest. The most of the resinous trees, when they are to be transplanted into the nursery lines, may be one year's seedlings; others of the resinous, and all the hard-wood kinds, should not generally be less than two years' seedlings before being transplanted to the lines. The transplantation from the seed-beds to the nursery lines may take place in autumn, after the descent of the sap, or in spring, before vegetation has commenced. The operation may be performed by the spade, but is often performed by the dibble. The plants are set at such distances in the rows that the horizontal branches of the young trees shall not interfere with each other, In transplanting, no part of the root should be lopped or shortened by the knife, nor the roots doubled in putting them into the ground; and care should be taken in planting, where the dibble is used, that the root shall be fixed firmly without being compressed at the neck."

Some kinds of tree-plants are propagated by cuttings, others by layers; but, after these copious extracts, though only from a limited and comparatively small portion of this work, it is evident that it contains an immense quantity of useful information; nay, we might say all that it was needful to communicate to persons entering upon the study and the practice of the matters treated of. But still it is a work where laborious and judicious care are much more prominent than that original or deep-sighted power that can throw new light upon any subject, particularly one of such scope. However, for the purposes intended by the author, this more illustrious display was not called for, and indeed might have marred the real good which undoubtedly is to be derived from the performance. Farmers and gardeners should become familiar with Professor Low's Elements of Practical Agriculture.

## GARDEN OPERATIONS FOR JANUARY.

### THE HOT-HOUSES.

In such a cold and often windy month the hot-houses require great attention. Some of the pine plants will now probably be shewing their fruit; at any rate, they require a good heat in the tan bed, to keep them in a growing state, but not much water when this heat is low. This is the time too for preparing tan and other articles which may be in request next month. Macphail, in his Gardener's Remembrancer, whom we follow, says, if there are successive pines in a hot-house or pit warmed by fire heat, it is likely they may require watering once or twice this month, but those warmed by dung-heat will want none. Eighty degrees is the medium heat with which fruiting pines should be watered. In gloomy weather, it is not proper to water over the leaves. If cucumbers were planted in boxes in the hot-house in August, perhaps a few fruit may be got from them this month; therefore let them be watered when they require it. Sow kidney-beans in pots for a succession. Cress, mustard, and rape-seeds, may also be sown twice a-week, in pots, and in rotten tan or vegetable mould, covering them well and lightly. They require no water. Grape vines that run up the rafters may probably show their fruit this month, and therefore require great care. If they are planted on the outside of the house, see that the stems be secured from frost.

### THE GREEN HOUSE.

Make such fires as are sufficient to prevent the frost from injuring the plants. Open the sashes, to admit air every fine day. The plants do not require much water. Decayed leaves should be taken off, and the house kept clean and sweet in every part. Smoking the plants with tobacco once a fortnight or so will destroy some sort of insects by which they are liable to be attacked. Though the weather in this month may not be frosty, it is necessary to make fires occasionally, to keep the plants from damping. If the frost be kept from them in the night time, it is sufficient, and if a thermometer be in the house, it should rise in the course of the day to about fifty or fifty-five degrees.

### THE KITCHEN GARDEN.

If the weather permit, sow radish and lettuce, towards the latter end of the month, on a warm dry border of well-prepared earth. · Peas of different sorts may be sown. Those sown in the former months, which are come up, may, in a dry day, have a little earth drawn lightly to their stems, which serves to preserve them from the frost. · Plant broad beans to succeed those planted in December, four feet row from row, and four or five inches distant from each other. They do best in sandy loamy earth, trenched two feet deep, and well manured. In open weather, earth up late-planted celery, to blanch and to help to keep off the frost. About the latter end of the month, spinach may be sown in drills between the rows of peas or beans. If the stems of brocoli stand high out of the ground, earth them up as high as can be done. Towards the close of the month, put out a succession of cabbage plants. The early York and sugar-loaf are proper sorts; they delight in ground not too heavy, and well manured. Red cabbage plants may also be set out. If the weather be open, lettuce-seeds of different sorts may be sown on a warm, sheltered border; as also radishes. In mild days, if it be necessary, tie up for blanching, leaves of endive; but a better way is to nearly cover the plants in a bank of dry earth; or they may be set in earth in an open shed. January is a good season for preparing vacant ground for the operations of succeeding months.

### THE FRUIT GARDEN.

In open weather, prune apple and pear trees of all sorts; cut out rotten or decaying branches. It is a good time to dig and trench about and manure apple or other fruit trees. Prune and nail plum, pear, and apple trees on walls or espaliers; cut them in such a manner as that the bearing spurs do not extend too far from the leading branches. To forward the work in the spring, peaches, nectarines, and apricots may be pruned and nailed also; although it is better to let this alone till the trees are ready to push, if time can then be spared. If not completed last month, endeavour to finish the cutting of gooseberry and currant bushes, that the ground may be dug among them, before the roots begin to grow. Plant cuttings of apple, pear, and plum trees; they will come into bearing soon, and do not grow so luxuriantly as those from grafting. Grape vines against walls in the open air may now be pruned; but the safest way is to let them alone till next month, for fear of hard frost. Make, if possible, plantations of currants, raspberries, and gooseberries. If the weather is open, all sorts of fruit-trees may be planted. Tie such as are standards to stakes driven fast into the ground. Protect the stems from hares. Defend the roots of newly planted or transplanted trees from frost, by litter or leaves.

### THE FLOWER-GARDEN.

The different kinds of flowering shrubs may in this month be pruned. Cut out all luxuriant and straggling superfluous shoots: those that are crowded must also be thinned, observing that the branches of one shrub do not interfere with another. Take up from about them all suckers which have grown from their roots, and then dig the ground among them neatly, so that the whole shrubbery may be clean, and have the appearance of uniformity. Plant flowering shrubs and herbaceous plants of every kind when the weather is open. In order to screen parts requiring such protection, hedges may now be planted—as hawthorn, beech, hornbeam, privet, elder, willow, poplar, yew, &c. Edgings of box and thrift may be put into dry soils. Lavender, thyme, southern-wood, daisies, and several other low-grown plants may likewise be set out for edgings. The best sorts of tulips and hyacinths should be attended to. If they are in beds, in frosty weather, cover them with litter, or with mats upon hoops; but as soon as the frost goes, uncover them. Bulbous roots which have been kept out of the ground till this time should now be planted. The sorts generally reserved for this purpose are the anemonies, ranunculus, narcissus, jonquil, iris, crocus, snow-drop, tulip, &c. These may be planted here and there in the flower-borders or in beds.

### THE NURSERY-GARDEN.

Plant cuttings of all kinds of shrubs, fruit and forest trees, which can be raised by this method. Young forest trees and shrubs of all sorts may be transplanted safely. Make plantations of stocks for budding and grafting upon; plant them in rows from two to three feet apart, and about eighteen inches from one another. Young plants and seedlings of arbutus, cypress, cedar of Lebanon, and many other evergreen and deciduous sorts, will require to be protected from severe weather, which may be done by putting frames over them, or by arching them over with hoops and mats. If in pots, they may be plunged in rotten tan, leaves of trees, saw-dust or light earth. There are various kinds of hardy trees and shrubs which require to be propagated by laying; and when the weather is open, it may be done this month. Choose branches that will easily bend to the ground, fasten them down with hooked pegs, and divide the last year's shoots equally; bend them into the earth four inches deep; cut off the ends of the laid shoots, which should stand out of the ground about six inches.

## HINTS ON THE MEANS OF NATURALIZING TENDER EXOTICS.

It is quite clear that the power of art in naturalizing tender exotics, is not yet fully known. We have been particularly impressed with this idea, after considering the contents of a letter written by Dr. Macculloch of Woolwich, a number of years ago, and published by the Caledonian Horticultural Society, from which we now extract freely. The writer says, that having visited Guernsey, he was much struck with the peculiar

luxuriance exhibited by many plants, which either grow with reluctance, or refuse to grow at all, even in the mildest counties of England. The sight is very impressive to an English visiter, particularly when he compares the very slight advantages of climate which that island appears to possess. The facts, however, led him to speculate on the subject, and the following are some of his observations and theories.

Among those plants referred to, as flourishing in Guernsey, he first mentions the Amaryllis. It is said to have been brought from Japan, a country possessing such a variety of climate, that it might well afford plants suited to any latitude. But the writer says, he thinks it yet a point to be ascertained, whether there is any thing in the climate of Guernsey peculiarly favourable to the growth and flowering of this plant. This is a point which cannot be determined till the cultivation of it is carried on in England to the same extent to which it is practised in Guernsey. The gardeners of Britain are satisfied with returning to the earth the few roots they receive in flower; but are scarcely content to wait till the period of flowering of the exhausted individual shall again return. In Guernsey, every gardener, and almost every petty farmer who has a bit of garden ground, appropriates a patch to this favoured root; and the few hundreds of flowers which are brought to England in their season, or which are kept for ornament on the island, are the produce of thousands of roots which are there planted. The average rate of flowering is not more than fifteen or eighteen in a hundred. The soil in which they are raised is light, and the beds are covered with sand; in other respects, there is no particular care taken of them, except keeping them very clean. What portion, the writer goes on to remark, of this success depends on climate, cannot be known, till experiments on a similar scale be tried in England. It is however true, that the bulbs are frequently injured in the winter, by a frost which has no effect on the hardy geraniums; so that it would be requisite in this country to guard against this danger, at least by matting or occasionally covering the beds. He adds, that some of its congeners, the Amaryllis bella donna, vittata, undulata, and formosissima, also flower in Guernsey without care, and with great certainty and vigour.

The Magnolia grandiflora is shy of flowering in England, if the mild climate of Cornwall be excepted, which nearly resembles that of Guernsey. In this little island, however, its flowering is as certain as its growth is luxuriant. Among the more hardy of the tender plants which Cornwall but barely preserves through winter, are the Hydrangea hortensis, Geranium zonale, inquinans, radula, glutinosum, and some others, which pass the winter without difficulty, and emulate in the summer the luxuriance they possess in their native climates. Many tender and transient varieties of flowers, and among those the varieties of the pink tribe, are remarkable for the facility and certainty with which they are propagated, and for the constancy of their characters. Every rustic cottage is covered with geraniums, and ornamented with numerous pinks, rarely seen in this country but among careful florists. Even the greenhouse is influenced by the climate. But of all those shrubs which require such protection in England, the Verbena triphylla, is that of which the luxuriance is here most remarkable. In Guernsey it flourishes perfectly exposed, and attains the size of a tree of twenty feet and upwards, spreading in a circle of a diameter equal to its height, and its long branches reaching down to the ground on all sides. The writer enumerates other plants of tender constitution in Britain, which appear equally hardy in this more uniform climate.

In the production of many fruits, the gardens of this island are no less remarkable. The superiority of its Chaumontelli pear is well known, a superiority which the grafts imported into England do not retain. The purple and green fig grow readily as standard trees, and produce perfect fruit every year. Many varieties of the melon ripen without glasses. The Romana is even raised in Jersey, without the assistance of the hand-glass, and is cultivated there in large quantities. The usual method of proceeding with it is to dig a hole in the earth, into which is thrown a small quantity of hot dung, and above that, ten or twelve inches of earth. The seeds are then sown, and the young plants, although sometimes covered with hand-glasses for a time, are often left entirely to nature. But the fact to which the writer chiefly calls attention, is the naturalization of a native of very warm climates, the Canna Indica. This very tender plant has become thoroughly habituated to the climate, scattering its seeds every year, so as to prove a weed in the gardens which it has occupied.

Upon the foregoing circumstances and facts Dr. Macculloch speculates. He attempted, for instance, to introduce the Canna Indica into England, from seeds which he brought from Guernsey; but the experiment was interrupted by an accident, and it was not again tried by him. He thinks, nevertheless, that it should be repeated, and that similar attempts should be made to naturalize other ornamental or useful plants, which have hitherto foiled us, chiefly perhaps because the trials have been ill conducted. Abundant experience has shewn that the propagation of a plant, by cuttings or offsets, has little or no effect in changing its constitution, and the instances above cited shew, that the seed will produce a hardier progeny; a progeny which in time may possibly be habituated to bear all the range of temperature which the globe affords.

To carry this speculation into practice, it is evident that in most cases the attempt will fail, if the transition is violent; and that we should often act unavailably in endeavours to naturalize the inhabitants of Bengal or Jamaica to the climate of England or that of Newfoundland. It is probable, however, that in the immense number of untried plants, many might be found, which, like the Canna Indica, would even bear a change as great as that now mentioned. But to pursue this system of naturalization with any great hopes of success, it would be necessary that the transition should be more gradual, and that the transplantation should be carried from a hot climate through some intermediate one to our own more ungenial shores. The very peculiarity of the climate of Guernsey, arising chiefly from the uniformity of its temperature, would afford us ground to hope that it possesses many of the requisite properties, and that it might form the step required in this experiment. It is certain that neither the thermometric state of a given country, nor any meteorological condition which we have been yet able to observe, are competent to explain the peculiar affection of plants for particular regions of the earth. Whatever this obscure condition may be, it appears that Guernsey possesses requisites which are not common, and which to us, at least, are elsewhere inaccessible. These considerations, therefore, should stimulate us to make trials, which, in their results, may possibly prove useful as well as ornamental. Many of the fruits which are now too tender to endure our climate, might be taught to produce seeds, which would at length give us products equal in goodness to the original, and of a hardier character. It is not unlikely, for example, that a variety of the melon, from seeds produced in Guernsey, might be made to grow without the aid of glass in England. Perhaps even the caper or the orange might be naturalized through the same medium. The process which has naturalized the Canna Indica, might go far to put us in possession of many other desirable objects, at least in cases where, like the melon, the generations can be rapidly repeated, and where the produce goes hand in hand with each successive generation. Thus, possibly, even the elegant pine of Norfolk island might become a British tree, although the toil of many years would be requisite for effecting such a purpose.

An economical object which depends on this property of plants, and which seems to be more in our power, is the perfect naturalization of the vine. It is well known that from many of the ordinary varieties cultivated in this country, we can always insure a crop of grapes, but not always a crop of ripe ones. From two or three of these, the chance of ripening out of doors is considerable; from many others it is hopeless.

It is not improbable that by successive sowing of seeds other varieties might be produced, still more certain of ripening than those which succeed best with us—the Miller and Sweetwater.

Dr. Macculloch next takes up the potato, which he maintains has as yet been but imperfectly naturalized; and that this imperfection is to be charged to the common practice of propagating by the tubers. It is true that seeds have been occasionally sown, and new varieties thus obtained; but the experiment has stopped in the first stage, having been always undertaken for the mere purpose of producing these varieties, without any regard to that much more important object, the production of a plant sufficiently hardy to bear at least the first frosts of winter—a point of great consequence to the people in the northern parts of Britain. It is plain that it would be necessary to sow the seeds of successive generations many times before the proper degree of hardiness could be expected, and that the process would therefore demand both patience and time, such as called for the exertions of public bodies rather than of private individuals. The difficulty of obtaining seeds from seedling plants could be obviated, in some measure, by depriving the young plant of its tubers, and thus compelling it to direct its energies to the other and more common mode of propagation with which nature has provided all plants.

Dr. Macculloch very properly concludes this speculation of his, which we have copied from pretty fully, by stating a formidable objection which stands in the way of our attempts to naturalize particular plants. In every case where the useful varieties have been the result of cultivation in a warmer climate, from a base and useless parent, it is to be feared that the process followed in naturalization would again throw the plant back to its original state. But this fear should not, we think, deter the enterprising from the experiments recommended above; neither does it seem probable that it would be a universal result, and altogether disheartening.

## ST. MICHAEL ORANGES.

In a volume lately published, called, "A Description of the Azores," constituting the Archipelago of islands, that belong to Portugal, and lie in the midst of the Atlantic Ocean, there are some passages regarding their soil, climate, and vegetation, worthy of our notice. The author is a Captain Boid, who, under Admiral Sartorius, accompanied Don Pedro in his expedition thither, to organize the forces destined to rescue his bleeding native country.

These islands apparently are of submarine volcanic formation. They are represented by the writer of the above-mentioned work, as enjoying the most salubrious temperature; in spring, vegetation shoots forth with a rapidity and vigour that is astonishing; the herbage is of the freshest verdure, the flowers the most fragrant and brilliant. But it is of St. Michael's, the principal island, we speak particularly, every feature of which exhibits traces of the agency of fire; the roads and paths are over cinders, pumice, or calcined stones of some sort. Yet, from the decomposing qualities of the atmosphere, so rich and fertile is the generality of the soil, that with industry it might be rendered the most productive spot in the globe. The volcanic matter itself possesses a fertilizing quality. It appears with the evaporations that it is carried up into the atmosphere in the form of dust, and thence diffused over the land, where it mingles with the soil, most beneficially imparting thereto its peculiar virtues. The author thus writes—

"The country surrounding Alagoa is extremely rich and fertile, producing grain and wine, with an abundance of the finest oranges and lemons of St. Michael's; and we spent a quarter of an hour in an adjoining orange quinta, where an intelligent old man amused us with a history of the growth and cultivation of that fruit, to the following effect. The orange plantations or quintas, are in general the property of the morgados; they are of large extent, always encircled by a wall 15 feet to 20 feet high, and within a thick plantation belt of the faya, cedar tree, fern, birch, &c. to protect the orange trees from the sea breezes.

"The trees are propagated from shoots or layers, which are bent at the lower end into the ground, and covered with soil until roots begin to strike, when they are separated from the parent stem and transplanted into a small excavated well about three feet deep, (lined with pieces of lava, and surrounded at the top by plantations of laurel, young faya, and broom), until the tender orange plants are sufficiently strong, at which period the plantations immediately round them are removed, and each plant begins to shoot up and flourish, after which no further care is taken of it, beyond tarring occasionally the stem, to prevent injury by insects; and it in time spreads out with the majestic luxuriance of a chesnut tree. In this country, it only requires seven years to bring an orange plantation to good bearing; and each tree, on arriving at full growth, a few years after, will then annually, upon an average, produce from twelve to sixteen thousand oranges; a gentleman told me he had once gathered twenty-six thousand.

"The crops are purchased previous to their arriving at a state of maturity, by the merchants, who ascertain the value of the probable year's produce through the medium of experienced men, and then make their offer accordingly. The men thus employed to value orange crops, gain a livelihood thereby; and such is the skill whereto they attain, that, by walking once through a plantation, and giving a general glance at the trees, they are enabled to state, with the most astonishing accuracy, on what number of boxes the merchant may calculate. It becomes, however, quite a matter of speculation to the purchaser, as orange crops are a very uncertain property, and subject to various casualties between the time they are thus valued and the gathering. For instance, a continuance of cold north or north easterly wind will cut them off; a violent storm will sometimes lay the whole crop on the ground in a night, or it may be entirely destroyed by insects.

"Nothing can exceed the rich luxuriant appearance of these Hesperian gardens, during the principal fruit months, namely, from November to March; when the emerald tints of the unripe, and golden hue of the mature fruit, mingle their beauties with the thick dark foliage of the trees; and the bright odoriferous blossom, which diffuses a sweetness through the surrounding neighbourhood, is quite delicious.

"The present amount of oranges and lemons exported, is upwards of 120,000 boxes, and nearly seventy or eighty vessels are sometimes seen lying in the roads, waiting to carry them to Europe; besides these, a large quantity of the sweet lemon is cultivated for the consumption of the inhabitants: it is produced by grafting the sour lemon on the orange, but is tasteless and vapid, though esteemed salutary and refreshing by the natives.

"There is a species of epicurism peculiar to the Azores, with respect to oranges, particularly observed by the higher classes, who only eat that side which has been most exposed to the sun, and is of course, in its fresh state, easily distinguished by the tint—a refinement we are unable to emulate, the colour being rendered uniform by age."

One is so warmed by such descriptions, as to dream of a perfect paradise being still on earth. When speaking of the town of Villa Franca, he says, that the neighbouring country appears to be of the most fertile and luxuriant character; in depth and quality of vegetable soil surpassing all that he had ever seen. These impressions were strongly supported by the exuberance of its productions. The oranges were extremely delicious, and the grain of all sorts excellent, as well as the wine, which is plentiful. Here is something for agriculturists as well as gardeners to note. Who will not now build castles in the air? And yet the author gives abundant reasons and facts to support the delightful picture:

"The grain crops are never known to fail; and with even the little agricultural industry that does exist, nearly 900,000

bushels of grain, independent of pulse of all sorts, are annually raised, one-third of which is exported to Europe. I observed the Indian arrow-root every where growing in abundance, and was told by some English residents, that it is very little inferior to that of America. The earth is also covered with aromatic herbs, plants and wild flowers, springing up, as we saw them at that beautiful season, in all the splendour of cultivation procured by the pampered nursing of a London market gardener. Were facility of intercourse established by the prosperity of the island, and were the purchase of land made easy, how admirably adapted for a vast horticultural establishment would St. Michael's become !—where, through loveliness of climate, aided by the industry and scientific skill of some of our English gardeners, the fruits, plants, trees, and flowers peculiar to every part of the world, might be reared to perfection; and thus, by the rapid communication of steam-boats, the markets of England might be as regularly and cheaply supplied with the exotic productions of a tropical climate as with those of her own. The rich and more delicious fruits of the warmer latitudes, together with the beautiful and hitherto rare specimens of their floral tribes, would find an easy transfer to our chilly shores, as well for the gratification of various florists and amateur gardeners, as for the luxurious boards of the rich.

## ON THE CULTURE OF ROSES,

### AND HOW TO MAKE THEM BLOSSOM EARLY IN SPRING.

The Rose-tree is propagated by laying down young shoots in autumn or spring, and by suckers which arise from the roots of the plant. But to obtain a constant supply of roses from an early period of the year, a forcing house should be appropriated to them, or at least it should be such, that nothing but plants requiring a similar heat and treatment introduced.

One method of forcing roses, is to put the pots into a bed of warm tan, which with the assistance of fire heat, brings fine blossoms at an early season. But instead of this plan, Mr. Macphail tells us that he proceeded in a preferable manner. Instead of plunging the pots in tan in the pit, he covered that which was old and rotten with sand, and put the pots in rows upon the surface of it. By this method, the roots are not in danger of being hurt by bottom heat, and will therefore bear forcing for several years successively. And as it is necessary, at least once a week, to turn out of the house plants which have come into a blowing state, as well as those which happen not to produce buds worth house room, to be replaced by fresh plants, there is by his mode of procedure no inconvenience or expense like that incurred when the pots are plunged in bark.

Any sort of rose may be forced; but for this purpose the moss provence, the cabbage provence, the monthly and the common provence, are the best. A suitable time of the year to begin this operation is about the beginning of December; and if a regular constant supply be required, a few pots should be set in every week. The air of the house may be kept from about 55 to 65 degrees of heat for about three weeks; but, towards the end of December, this must be increased; the thermometer should rise as high in the morning as 65, and in the course of the day to about 75; when the sun shines, it may be up to 80. To prevent insects from breeding on the plants, the house should be filled with smoke once a week. The earth in the pots about the roots, should be constantly kept in a moist state, and watered all over their leaves twice in the week at least; but the rose buds just ready to burst should be passed over; for water injures flowers in blossom, or ready to come into that state. Clean water, and about the degree of heat kept in the house should only be used. Let the rose-house be free from every disagreeable smell; and when the flues are hot, sprinkle them with water occasionally, so as to raise a fine steam, which is genial to their growth.

The flower buds are very liable to be destroyed by a small grub-worm, which rolls itself up in the leaves: and as there seems to be no way of destroying it but by the hand, the plants should be carefully examined every day, and when any leaf is observed to be curled up, it should be nipped off, for there is every likelihood that one of these hardy insects is there concealed.

The pruning of rose bushes to be forced, should be performed in a manner somewhat different to that applied to those in the open air, which do not blossom before June. The shoots of the latter may be cut, even to the old wood and lower, without preventing them from blowing; but not so with the former. The safest course here is to defer the process till after they have been in the forcing-house, and their buds become so prominent that a skilful person may be able to distinguish blossom buds from shoot-buds.

Those who intend to force roses, should look forward and take care to be provided with a succession of healthy plants. If rose trees be potted in good earth, and well watered in dry weather, they may be forced every year with advantage. But if they be forced successively, they ought not to be suffered to blow in the summer or autumn after having been set out of the forcing-house. When the bushes become weak from frequent forcing, they should be put away out of their pots into the open borders, or be rested for twelve months. In case their branches have grown too high and naked, they may be cut down; for if they have good healthy roots, they will break forth from the old wood and produce plenty of bearing shoots. Every year rich fresh earth should be applied to forced rose-trees; to do this, scrape off that which is around them, to about three inches depth from the rims of the pots, and replace the same with the new soil. In the course of the summer, the plants may be watered occasionally with thick water from melon beds, or from dunghills in a state of fermentation.

Rose-trees to force, should be potted in earth of a good loamy nature, well mixed with rotten dung. Rich earth from the kitchen garden will suit very well. Before such trees are forced, they should have been growing in the pots at least for twelve months.

## ORCHARDS IN THE CARSE OF GOWRIE.

We have more than once presented our readers with particulars respecting the Lanarkshire or Clydesdale orchards, certainly the most extensive and valuable of any in Scotland, when taken as descriptive of a district, and as a whole. But there is another quarter of the kingdom not unworthy of consideration as respects the same sort of rural economy. We mean the Carse of Gowrie, so celebrated for its exhaustless natural fertility. The Carse is situated on the north bank of the Tay, and lies between Perth and Dundee. It measures in length about sixteen miles, and about four in breadth. Near to the middle of the Carse there is a rising ground, running in a parallel direction with the river, almost the whole length of the Carse: the summit of this gently sloping ground rises from 60 to 100 feet above the sea, and on it are several villages, demesnes, and orchards, some of the latter very old. In some parts of this ridge the soil is a brown-coloured sandy loam, on a cold clayey bottom: in others it is a good black loam, on a gravelly bottom; in others, again, it is a reddish, brick-coloured loam, or a mixture of sand and clay.

To the north of the ridge alluded to, and between it and the braes or hills which bound the Carse, is a fine level, from one to two miles in breadth, which has every indication of having been the bed of the Tay at one time. Its surface now is about forty feet above the sea, and consists, towards the centre, of a black mossy soil, and on the sides of a sound black loam. Not very many years ago, this expanse was entirely a marsh, and productive only of aquatic plants; but by draining it has been brought to a high state of cultivation. Fruit trees, it is be-

lieved, have not been attempted to be raised on this too mossy soil. But, on the river side, to come back to the more southern boundary of the Carse, where the soil is a strong clay, from fourteen to twenty feet deep, having different strata of river sand, at various depths. At many places there is to be found a bed of moss, in which there are the remains of old trees. In this division of the Carse the valuable orchard of Monorgan, and several more, flourish. Monorgan is not only the best in the district, but one of the oldest. Where the strata of sand appear within three feet of the surface, the trees grow to a great magnitude, and preserve their vigour to a great age: pear-trees are of an uncommon size, some of which are laid on their sides by the storms that upset them probably fifty years ago; yet these seemed to be the most vigorous and healthy.

Messrs. Mackray and Gorrie, twenty years ago, from whose account we extract these particulars, say that they observed a tree at the Pow of Errol, which, to the best of their information, must have lain upwards of fifty years: its stem measured about twenty feet in length, and about twenty inches in diameter; when it fell, the trunk had split right above the root, and the wound had since increased, so that only about six inches of the bark on the under side of the trunk remained sound, to convey nourishment from the root to the branches, which had now formed tops as large as four ordinary trees of from twenty to thirty years' standing. Although the trunk was split and shattered in many places, the branches, which looked like so many thriving trees, exhibited more of the appearance of health than many other trees in the same orchard, notwithstanding the limited channel through which they received their nourishment. The instance given was by no means a solitary one, but might be met with in some shape in every one of the old orchards. The facts certainly are curious, and calculated to interest the speculation of horticulturists. The reporters say, that the health of the branches of these shattered trees may be owing, in some measure, to the settled state of the roots, which can suffer nothing from wind-waving, or perhaps from the moisture which surrounds the bark of the trunk, where there may be still the remains of vegetable life. But to come, for a moment, to the new orchards in the Carse of Gowrie:—These are now numerous and extensive; they are also conducted with great spirit and judgment. We select a notice of one within the pleasure-grounds at Rait, which contains from eight to nine acres, where the soil, like the most part of the braes of the Carse (in which division of the Carse the orchard in question is situated), consists of a strong black loam, from one to four feet deep, partly on a rocky and partly on a gravelly bottom. It is naturally sheltered on the north by the rising ground that bounds the Carse in that direction; it is itself on a rising that mounts from 40 to 120 feet above the sea. On the east and west it is sheltered by a strip of plantation, and on the south by a stone wall. It has been completely drained, and, in fact, forms a part of the lawn. But what we particularly select this specimen for is on account of the peculiar plan in which the orchard-trees are planted. Instead of being in rows, as is generally the case, they are in circles, these circles expanding regularly from a centre. The advantages presented by this mode of planting are, the trees being planted with the same precision and regularity as if they were in straight lines, without the stiff formality of appearance, and therefore they are more ornamental. Nor, from the detached manner in which the trees stand do they prevent the influences of the sun and air, to the same degree that they would if in straight lines. As to ploughing amongst them, again for annual surface crops, this operation can be performed without ever turning the horses, and the next ploughing may be conducted conveniently and profitably, in so far as throwing back the first is concerned, merely by reversing the course of the plough; a small centre alone remaining, not convenient for the plough's operations.

We might here give a list of the principal apples, pears, and plums cultivated in the Carse of Gowrie orchards; but of late our readers have been presented with full catalogues of fruit-trees, as suited to Scotland and England, and therefore we cannot at present repeat a similar task. We forbear also enumerating the names and size of the principal orchards. It may, however, be stated, that thirty-two of them occupy about 130 acres. The rents derived from them may average from sixteen to twenty pounds sterling per acre, and the under crop about six. But many of the old neglected orchards bring much less.

From this rough and hasty outline it will appear that the Carse of Gowrie furnishes orchards of moment and amount.

## ON THE CULTURE OF THE CARNATION.

The carnation (Dianthus Caryophyllus flore pleno) consists of several varieties, which florists distinguish by the names of flakes, bizarres, and picottees. All of these will grow in any soil or situation, and are easily propagated by layers and cuttings; but it is observed, when they are kept long on the same ground, they frequently run from a fine striped and variegated to a self or red colour. Therefore, to keep up a good stock of these flowers, recourse must be had to sowing seed; but as the carnation flowers late in the season, it is very seldom that ripe seeds can be obtained in the open air in this country.

To obviate and overcome this difficulty, Mr. Mitchell at Moncrieff House, as detailed a number of years ago, employed the following means. His practice was, when the plants are in flower, to select what he considered the best, that is, such as have fine long regular pods, not inclining much to burst, with rose-leaved petals, and good colours, rather light than otherwise, or having more white than red. The layers of these he took off at the usual time; put them in small pots, and sheltered them in a hot-bed frame during the winter. In the month of March he put them in pots about one foot in diameter, having previously prepared a compost, which consists of a pretty strong light-coloured loam, with a third vegetable mould of rotten tree leaves and a small quantity of river sand. As soon as the flowers expanded, if they were much crowded with leaves, he pulled out a few to give room to the seed-pod to swell; and whenever the flower began to fade, he pulled out the whole of the petals without hurting the styles or horns that proceed from the point of the seed-pod. He often found it of great advantage to slit down one side of the calyx, to drain out any moisture that may lodge in the bottom of the cup, which would soon damp and rot the pod: it is also very useful to cut away about one third of the calyx, to encourage the swelling of the pods. The seed is known to be ripe when the pods become a little brown and hard. They are then cut as they ripen, and hung up in a dry place till near the time of sowing, which is in May.

He sowed the seeds in a frame, without any bottom heat: and when the plants were sufficiently up, he took away the glass, and threw a net over them, to keep away the birds. If they came up too thick, he transplanted them into another bed, where they continued till planted out for good. He observes, that some of them are longer in coming up than others, and are also very weak and small. These he nursed in pots, and frequently found them turn out to be the very best sorts, although they sometimes did not flower till the third season. A greenhouse, a hot-house, or a hot-bed frame, are each and all very useful to ripen carnation seed.

A Mr. William Crawford, gardener at North Park, about the same period that the above particulars were submitted to the Caledonian Horticultural Society, read a paper regarding the method which he found most successful for blooming carnations, which we also have satisfaction in laying before our readers. The information afforded by these gentlemen, every one must perceive, is clear, full, and manifestly the result of enlightened experience.

In the month of November he began to collect his compost, which is as follows:—one half fresh sound loamy earth; one fourth rotten cow-dung, one year old; one fourth vegetable

mould, two years old: one sixth of the whole, coarse sea or river sand. These ingredients are well mixed together in an open exposure, and turned frequently during winter; but before he used the compost, he generally put it through a coarse riddle, such as is commonly used for lime, to reduce its parts, and take out stones or any extraneous substances it may contain.

In the end of March or first of April, as the season permitted, he began to prepare his bed for planting. He made choice of an open situation, and stripping off the original soil to the depth of one foot, he substituted the compost as above prepared. He then planted, at the distance of fifteen inches each way. At this period he always conceived there is the greatest danger of having the plants destroyed by the cut-worm, wire-worm, or snails. The two former are often to be found near to the plants first attacked, not much above one inch under ground; they may be destroyed, and other plants completely saved; and the snails are kept down by picking them off morning and evening. He always found the dusting of hot lime rather hurtful.

When the flower-stems were grown to the height of eight or ten inches, they were supported with sticks; and as the stems continued to advance in height, the tying up was continued. The calyx of many sorts contains a great number of petals, which as they increase in bulk will burst, if not timely prevented by small slips of wet bass-mat tied round the middle of the pod, where it is most swelled, and appears to have the greatest inclination to burst: on the opposite side of the pod, it must be gently pricked with the point of a pin, that it may burst freely from both sides. If this was neglected, the flower produced a loose irregular appearance, totally destroying that compact circular form which a perfect flower ought to possess. When any of the flowers began to open and expand, such were shaded both from sun and rain by temporary coverings; but when the major part were in bloom, a cloth awning was placed over the whole, which was thrown off, or rolled up at every favourable opportunity.

Those who are particularly curious in blowing their carnations strong, carefully extract the weaker pods: in general three or four being as many as ought to be suffered to remain on one plant.

The same authority continues to tell us that the best time of laying carnations is as soon as the plants are in full bloom. To those who are cultivators of this elegant flower, he recommends light sandy earth, not too rich, for the purpose of laying, and not to cover the layer above one half inch deep, that it may have the advantage of the air. When the layers are properly rooted, which will be the case with most sorts in about three or four weeks after laying, provided due care be taken to keep them moist regularly in hot sultry weather, they should be immediately cut off and planted in pots or boxes made for the purpose, six inches deep, filled with fine light rich earth, at the distance of three or four inches apart. They are seldom injured by moderate rains or frosts at this season, but they should always be under cover for the winter by the first of November, in as dry a state as possible, to prevent mildew, which they are very liable to contract, if they have not a free circulation of air.

## BERWICKSHIRE.

This county is situated at the south-east extremity of Scotland, on the shore of the German Ocean, and adjoining the north-eastern border of England, deriving its name from the town of Berwick-upon-Tweed, which was formerly its head borough, but which has been long annexed to the Crown of England, though still enjoying a species of anomalous jurisdiction, in some measure separate from both kingdoms of England and Scotland. The county of Berwick now consists of two divisions, greatly distinguished from each other by their natural characters. The mountainous range of the Lammermoors is one—extending from the east to the confines of the county on the west; the other is the lower country, extending from the foot of the Lammermoor Hills on the north, to the Tweed, and the boundaries of the county on the south. The first is a bleak and unfertile tract, the summit level being upwards of 1000 feet above the sea; differing greatly from the Cheviot Hills on the southern side of the Tweed, which at a higher altitude are rich and verdant. This partly arises from the different nature of the mountain rocks of these two chains, but may be also partly produced by the difference of their aspect and exposure. The second, which is called the Merse, from its ancient name, the March or Border, rises gradually from the valley of the Tweed, to the foot of the Lammermoors; and though presenting from an eminence the appearance of an unbroken plane inclining towards the south and east, yet it is much diversified by numerous swells and knolls, and winding deep glens or dells, in which last the streamlets of the lower country flow in search of the larger waters and rivers.

Berwickshire is celebrated as an agricultural district of peculiar excellence in its general system of management, which consists in judiciously blending together the cultivation of grain and grass alternately, or what is usually called the "convertible agriculture." Under this system, a considerable portion of every arable farm is kept in pasture appropriated to the breeding and feeding of cattle and sheep; while the remainder is under aration for the production of turnips, ruta baga, and hay, as winter provender for the stock, and grain of all the usual kinds for sale: and accordingly, the land is changed from tillage to pasturage in regular succession. The short-horned breed of cattle is introduced into all the lower districts, and in many cases in the higher. The sheep of the lower country are the new Leicester breed, and have been brought to great perfection by the example of many eminent breeders. But the object we have particularly in view at present, is to say something of the Berwickshire admirable system of "convertible husbandry."

The Berwickshire husbandry extends to the counties of Roxburgh, Northumberland, and to North Durham: to the whole of what may be aptly called the Vale of Tweed, and is one of the most interesting systems that can be connected with any portion of the empire. Indeed, the plan which has been adopted in this district, or, to confine ourselves exclusively at present to Berwickshire, is probably the very best which could be devised, with a due regard to the circumstances of its soil and climate; and the farmers, by whom it is diligently and judiciously pursued, find it peculiarly satisfactory, in consequence of its combining two most important advantages—supplying the most abundant marketable produce of all kinds that are in constant request, and raising these at the smallest comparative expense. But as we have arrived, when come to this county, at one of the most renowned parts, as illustrative of Scottish agriculture, we shall quote, before giving a summary account of its features, as practised in Berwickshire, a few sentences from what Lord Kames said of the imperfections of Scottish husbandry about sixty years ago. He represents the instruments of husbandry to have been in those days sadly imperfect—the draft horses, as miserable creatures, without strength or mettle—the oxen scarcely able to support their own weight, and ten going in a plough, led on by two horses—the execrable system of infield and outfield generally established—the ridges high and broad, in fact, enormous masses of accumulated earth, that would not admit of cross ploughing, or of proper cultivation—shallow ploughing, universal ribbing, by which half the land was left untilled, a general practice—summer fallow, though common in three or four counties, yet only creeping on in others; over the greater part of Scotland, a continual struggle for superiority between corn and weeds—the roller almost unknown—no harrowing before sowing, and the seed thrown into rough uneven ground, where the half of it was buried—imperfect rotations of crops—little skill in harvesting—no branch of husbandry less understood than manure—potatoes in general propagated in lazy beds—swine but little attended to—and very few farms justly proportioned to the skill and ability of the tenant. What

man could believe all this, were it not upon such good authority, who has known Berwickshire for instance, during the last twenty years? It may be said in one sentence, that not one of these imperfections now exist there; so that Sir Joseph Banks might well declare that "Agriculture has derived, is deriving, and will derive, more benefit from Scotch industry and skill, than has been accumulated since the days that Adam first wielded the spade." But to be more particular—

The system of husbandry universally followed in Berwickshire consists, as already stated, in an alternation of pasturage and aration on the same lands. No absolutely fixed course, however, as respects cropping, can be said to prevail. Upon all the large farms (they are generally about 400 or 500 acres in extent) where live stock, black cattle, and sheep, form a most material object, about half of the arable land in each farm is kept in grass for pasture, and no fixed age prevails at which these pastures are broken up. This depends upon a variety of circumstances; the goodness of the pasture, or its falling off, sooner or later; the profitableness of stock, or the contrary; and the proportional profit to be derived or expected from the cultivation of grain. Frequently the proportion of land to be kept in grass upon the farm is fixed by lease; more rarely during its whole endurance, but generally for a certain period of its latter years, say the three, four or five last years of the lease. All these circumstances operating upon the judgment of each farmer, must necessarily produce great variations in the successive cultivation or rotation of crops. But the one great and pervading principle which guides the whole system of Berwickshire husbandry (the Merse is the division that we alone are considering) may be said to form its rotation or course of crops—that is, pasture and tillage alternately. While under tillage, a green crop, clover, turnips, or pulse, or a fallow, invariably intervenes between every two crops of white corn. Keeping these circumstances in view, the following plans may be adduced as instances of the most common practices, by judicious farmers.

On turnip soils, the land, after having remained in grass, for one, two, or more years, is broken up during winter or early in spring—the former by much the better practice—and is sown with oats, after one ploughing; or it is broken up in July or August, when the foggage or lattermath of the hay-land is sufficiently grown to admit the stock; it receives two ploughings across each other, and a good harrowing after both, to break down and reduce the grass clods, and to kill and bury the grass and clover roots; it is then ridged in convenient breadths of flat ungathered lands, and sown with wheat in October or November. This is termed *rag fallow*. Often it is sown in October or November with wheat after one ploughing only. It may be observed, that one ploughing is quite sufficient for procuring a crop of wheat from lay, where the soil is clay, or tending towards that kind of soil; whereas on dry turnip land the *rag fallow* is necessary to secure a crop; as that kind of soil, laid hollow by a single ploughing, would be vastly too much dried in the subsequent summer, to the very material injury of the crop.

In the second year the land is worked with turnips, manured with farm-yard dung, the turnips sown in drills, and the crop entirely or partly eaten by sheep where it grows.

In the third year, it is sown as early as possible with wheat, in proportion as the land is left free by the consumption of the turnip crop, from February to the middle of March—even sometimes a good way into April. Or if the turnips have been too late of being eaten off or removed, it is sown with barley or oats. Unless the soil be good, the wheat of the third year is seldom ventured on, when wheat was taken in the first year of the course. But whichever may be the crop in the third year, mixed grass and clover seeds are sown likewise on the land.

Hence, in the fourth year the land is again in grass. Upon some farms this course of cropping goes regularly on, in a rotation of four, five, or six years, according as the grass is allowed to remain one, two, or three years before. But in this course, the species of grain varies, being wheat, barley or oats, according to circumstances.

Upon very good soils this course may be continued indefinitely with perfect success, from four years to four years more, on condition that the turnip crop is always eaten on the ground by sheep, and that a good dressing of lime is given occasionally, as once in ten or twelve years. To preserve land thus managed in full vigour, it is requisite that the grass crop be pastured, or at least that the hay produce be returned to the soil in the shape of dung. But when the soil is inferior, this course requires the grass portion of its rotation to be protracted under pasture for two or three years, or more.

In very good turnip soil, and with some power of adventitious manure, the following course may be protracted for a considerable number of years:—1. Wheat from clover-hay: 2. Turnips eaten by sheep on the ground; 3. Wheat; 4. Drilled beans; 5. Wheat; 6. Turnips; 7. Wheat, &c. In this course a crop of rye grass and clover sometimes takes the place of the beans.

Upon this branch of management we need not go deeper, since it is obvious that no rigid rotation can be named, on account of varying circumstances. Some fields remain longer or shorter in productive grass; seasons, markets, situation, induce a farmer to increase or diminish his live stock, and consequently to throw more of his land into grass, or to subject it to a larger breadth of tillage. But still, one green crop must come between every two white ones (unless it may happen in breaking up old rich pasture, that two crops of oats are necessary to rot out the matted grass roots), and next, grass remain, according to the character of the land, and other circumstances, from one to seven years in pasture.

Before saying any thing on the second branch of the Berwickshire alternate or convertible system, we may just hint, that potatoes for the use of the farmer's family and servants must be grown, but unless in the neighbourhood of towns, they never constitute a regularly complete part of any rotation. Most farmers grow a portion of spring tares, to be cut for soiling their horses in the interval between the two cuttings of the clover crop. Frequently, a small quantity of flax is also raised for the use of the family, or partly as constituting one of the stipulations with married ploughmen, instead of their wages.

The cultivation of artificial grasses, for hay and pasture, forms a very prominent feature of the Berwickshire system of husbandry. These are always sown when the soil is in its highest state of fertility and tilth: and after having been as much as possible cleaned from weeds of all kinds, both vivacious rooted and annuals or seedlings, that is to say, mixed grass and clover-seeds, are uniformly sown with or among the first grain crop which succeeds a well wrought and manured fallow, or a turnip crop. The essential character of improved husbandry is diametrically opposed to the old system; in which grain crops upon tillage land were persisted in as long as they could continue to pay a little more than seed and labour; and the soil, worn to almost a caput mortuum, and polluted by a legion of weeds, was then permitted to *gather heart*, as it was called, which, after a series of years, restored it to the capability of again growing very inferior crops. But the artificial grasses have shown observant husbandmen the true secret of profitable agriculture, for they enable him to preserve and advance the fertility of the soil, unless he exhaust its vigour by afterwards overcropping. Well-managed artificial grasses not only enable the farmer to improve his land, but they are a profitable crop.

The sorts of grasses, and the quantities of each, in the mixture given to the acre, depend partly upon the nature of the soil, and partly upon the intention of the cultivator, in regard to the temporary or permanent state of the field, or break, which is to be kept in grass. When intended only for one or two years, and to be then taken up for a course of tillage, the usual mixture for an acre of good turnip soil is about half or two-thirds of a bushel of clean and well-dressed rye-grass seed, with ten or twelve pounds of red clover. Sometimes two pounds of white clover, and a pound or two of yellow or trefoil, are

added, proportionally diminishing the quantity of red clover-seed. This last addition is more especially given when the crop is particularly intended for pasture. On dry lands or spongy soils, a larger portion is usually given of all the enumerated seeds. As red clover is by no means permanent, but usually dies out in the third year, and often in the second, if the grass is meant to remain for a greater number of years, the general mixture is somewhat like the following:—One bushel of clean rye grass seed, six to ten pounds of white clover, four to six pounds of red clover, two pounds of trefoil, and frequently a pound of narrow-leafed plantain. There are hardly any instances of the seeds of natural grasses, as they are called, sown, probably because old grass or improved upland meadow crop is hardly ever mown for hay, and because farmers are afraid to poison their fields by sowing perhaps an infinity of the seeds of weeds. Care must be taken in purchasing rye-grass seed to have the perennial, and not the annual, which can only be secured by depending on the good faith of an honest seedsman.

The time of sowing grass seeds, when among broad, cast, oats, or barley, is generally immediately after these grains, when the land has got all its harrowing except its last course. When sown among drilled grain, it is usually postponed until the soil between the drills has been hand-hoed, taking advantage of the first summer shower: sometimes immediately previous to hand-hoeing which covers in the seeds. We add, that much the larger proportion of cultivated grass produce, both young and old, is in Berwickshire applied to the feeding of live stock, either milk cows, young cattle, horses, breeding sheep, or fattening cattle and sheep.

The result of this convertible husbandry is this, that where it is thoroughly established and properly followed out, greater crops are raised, and higher rents are paid than in any other parts of the British dominions. In good seasons and fertile lands, the produce is calculated to be from 32 to 45 bushels of wheat, from 48 to 55 bushels of barley, from 60 to 75 bushels of oats, and from 30 to 35 bushels of beans, Winchester measure, per statute acre. As to green crops, 30 tons of turnips, 3 tons of clover, and 8 tons of potatoes, are no uncommon crops. The style of cultivation in Berwickshire is comparatively economical, but on this point we cannot at present enter; it will fall to be considered very properly under some one of the adjoining or neighbouring counties; for, in our future notices. when a similar system of husbandry can only be described, we shall take up some other striking feature, either for its advantages, or to build upon it lessons and rules of advice and improvement,

But, to return for a moment to the system we have been speaking of and strongly commending, who does not see in it one remarkable excellence? In any turn of markets in favour of stock or grain, the farmer can suddenly take advantage of the change, by extending the branch that promises most profit, and curtailing the other. All farms in this county are held under regular leases, mostly for nineteen years' endurance. By these the farmers stipulate to pay a certain money-rent yearly, and there are no personal services or bondages.

## Description of the Plates.

### VALERIANA OFFICINALIS.

GREAT WILD VALERIAN.

Class—Triandria monogynia.

Nat. Ord.—Valerianeæ.

Gen. Char.—Corolla monopetalous 5-cleft, gibbous at the base. Seed 1, crowned with a feathery radiating pappus.

Spec. Char.—Stamens 3. Leaves all pinnate; leaflets lanceolate, serrate, nearly equal.

The root of this species of Valerian is composed of several long, slender fibres, of a dusky-brown colour, approaching to olive, that issue from one head. The stem is erect, and rises to the height of three or four feet. The leaves are of a deep glossy green, a little hairy on the under side. The flowers, which are small, and of a reddish white, are disposed in large dense corymbs.

In Derbyshire, Valerian is planted in rows 12 inches apart, and the plants 6 inches asunder. Early in spring the tops are cut off. At Michaelmas the leaves are pulled off, and given to cattle, and the roots dug up and clean washed, and dried in a kiln. The usual produce is about 18 cwt. per acre.

### GRATIOLA OFFICINALIS.

HEDGE HYSSOP.

Class—Diandria monogynia.

Nat. Ord.—Scrophularinæ.

Spec. Char.—Leaves ovate-lanceolate, serrated, 5-ribbed, smooth, somewhat longer than the flower-stalks.

It is a low perennial, a native of the south of Europe, growing in moist pastures, and flowering in June and July. From a cylindrical, white, creeping, jointed root, rise several slender erect stems, to the height of a foot or eighteen inches. The leaves are numerous, of a bright green colour, two inches long, and nearly half an inch broad. The flowers are inodorous and solitary. The tube is yellowish, with reddish streaks; the limb pale lilac or purple.

This plant forms the basis of the eau medicinale, and is strongly recommended for allaying irritation in gout and rheumatism.

Its name is derived from *gratia*, grace (of God). Matthiolus called it Gratia Dei, in allusion to its effects.

It is so bitter and obnoxious to cattle, that Haller assures us there are meadows about Yverdun rendered entirely useless by its abundance.

### TORMENTILLA ERECTA.

COMMON TORMENTIL, OR SEPTFOIL.

Class—Icosandria polygnia.

Nat. Ord.—Rosaceæ.

Gen. Char.—Calyx 8-cleft. Petals 4. Seeds roundish, naked, affixed to a small juiceless receptacle.

Spec. Char.—Stem ascending, branched; leaves ternate, sessile; stipules lanceolate, serrate.

Common Tormentil has a large perennial, woody, and generally crooked root, dark brown externally, and reddish white. It sends forth several erect stems, seldom exceeding a foot in height. The leaves are dark-green above, paler underneath. The flowers are small, of a golden yellow colour, and solitary.

Tormentil root is used as an astringent. It forms an excellent application, in the form of gargle, for ulcerations of the mouth or tongue.

In the Orkneys, the roots are used in the tanning of leather; excepting galls and catechu, it contains more tannin than any other vegetable.

### VIOLA ROTHOMAGENSIS.

ROUEN PANSY, OR HEART'S EASE.

Class—Pentandria monogynia.

Nat. Ord.—Violarieæ.

Spec. Char.—Hispid; roots somewhat fusiform; stems branching, diffusely spreading; leaves oval, cordate at the base; upper ones oblongly lanceolate, crenate; stipules pinnatifid; spur scarcely lengthened, obtuse, shorter than the sepals; nectary shorter than the stamens; seeds oblongly obovate.

This beautiful plant is frequently cultivated in the borders of the flower garden, where it is well deserving a place. If the weather is mild it begins to flower in the commencement of March, and will continue to produce them all the summer, and till late in autumn.

### MONSONIA SPECIOSA,

LARGE-FLOWERED MONSONIA.

Class—Monodelphia dodecandria.

Nat. Ord.—Geraniaceæ.

1. Valeriana officinalis.

2. Gratiola officinalis.

3. Nicotiana Tabacum.

4. Gentiana acaulis

5. Gloria Mundi.

6. La Triomphe Royal.

7 Tormentilla erecta.

8. Monsonia Speciosa.

9. Helianthemum Serpyllifolium.

10. Viola rothomagensis.

Gen. Char. — Sepals 5. Petals 5. Stamens 15 united; other cup 5-fid. Style 5-fid. Cocci 5. 1-seeded awned, at the base of the beaked receptacle.

Spec. Char. — Leaves palmate, 5-parted: segments finely bi-pinnatifid; petioles and calyces smooth.

This elegant plant is a hardy green-house perennial, native of the Cape of Good Hope. In its habit and fructification it bears great affinity to the geranium. As it rarely or never ripens its seed with us, it is propagated by planting cuttings of the root in pots of mould, and plunging them in a tan-pit, watering them as occasion may require; in due time buds appear on the top of the cuttings left out of the ground.

## HELIAN HEMUM SERPYLLIFOLIUM.

SEPYLLUM-LEAVED SUN-ROSE.

Class—Polyandria monogynia.

Nat. Ord.—Cistineæ.

Spec. Char. — Stem frutescent, procumbent, very much branched; branches ascending, smooth at the base, and hairy upwards; leaves oblongly elliptical, the margins somewhat revolute, underneath clothed with a white woolliness; upper ones intense green, glossy.

The present species is readily distinguished from all others by its leaves growing in a distichous manner. It is quite hardy, and is a very pretty plant for decorating rock-work, or growing in a pot; thriving well in any light sandy soil. Cuttings of it root readily planted under hand-glasses the latter end of summer or autumn.

## TULIPA GESNERIANA, Var. α.

La Triomphe Royale.

CARNATION TULIP.

Class—Hexandria monogynia.

Nat. Ord.—Tulipaceæ.

The *carnation* tulip is called by florists the Triomphe Royale, and for beauty of its pencilled stripes, it certainly triumphs over all the rest.

## TULIPA GESNERIANA, Var. β.

GLORIA MUNDI.

Its decisive *dark purple lines* at the *edges*, or in the *centre* of the petals *at their top*, together with its stately position, sufficiently characterize this individual, whose yellow ground is supposed to be an emblem of sublunary perfection.

Tulips with a *white* ground florists designate by the title of *Bybloemen*, and with a *yellow* ground by the name of *Bizarre*.

In cultivating choice tulips, an open airy situation, dry at bottom, is made choice of; there excavations are made commonly in the form of beds 4 feet broad, of any convenient length, 2½ or 3 feet deep. In the bottom a layer of well-rotten hot-bed dung is laid and well trod in, and on this 2 or 2½ feet of rich fresh sandy loam. On this the roots are planted 6 inches apart, and covered 4 inches. The best season is the beginning of November. In very severe winters protection by mats, or by a layer of decayed tanners' bark, may be requisite; but the tulip is very hardy, and almost the only protection it requires is shading and shielding from rain and winds during full bloom. The bulbs should be taken up annually as soon as the flowers are decayed, and kept in a dry, airy situation till wanted for planting.

## GENTIANA ACAULIS.

DWARF GENTIAN.

Class—Pentandria digynia.

Nat. Ord.—Gentianeæ.

Spec. Char.—Corolla 5-cleft, campanulate as long as the square stalk.

As most Alpine plants do, this loves a pure air, an elevated situation, hnd a loamy soil, moderately moist. It flowers usually in May and sometimes in the autumn. In brilliancy of colour none of the plants of this family (which are all beautiful) exceed the present species.

In mountainous situations the present plant has no stalk, whence its name *acaulis*, but cultivated in gardens it acquires one.

It may be propagated by parting its roots at the close of summer; but the strongest and best plants are produced from seed.

## NICOTIANA TABACUM.

VIRGINIAN TOBACCO.

Class—Pentandria monogynia.

Nat. Ord.—Solaneæ.

Spec. Char.—Leaves lanceolate, ovate, sessile, decurrent. Segments of the corolla acute.

Every part of the plant is downy, clammy, and fætid. The stem is erect, round, branched towards the top, and rises to the height of 4 or 5 feet. The leaves resemble those of the Foxglove, and are numerous and of a dull green colour. The flowers are produced in loose panicles, upon longish foot-stalks; they are of a pale greenish colour, flowering from July to September.

Tobacco appears to thrive nearly in every part of the globe; but what is principally imported into this country we derive from Maryland and Virginia. The latter, being sweet-scented, is generally preferred here.

When Raleigh brought tobacco from Virginia to England, in 1586, whole fields of it were already cultivated in Portugal; and so quickly did the practice of smoking spread, that at the end of the 16th century, bitter complaints were made in England of this imitation of the manners of a savage people.

King James I. imbibed similar prejudices, and wrote a curious work, entitled "A Counterblaste to Tobacco."

## CANADIAN TIMBER.

In Mr. Montgomery Martin's third volume of the History of the British Colonies, which has lately been published, embracing the possessions in North America, a great body of most important statistical information is to be found. In those sections that are devoted to the vegetable kingdom, the forests of Canada, of course, obtain considerable notice. The writer is a warm advocate in support of our Colonial interests, but of none is he more so than those parts now alluded to. Indeed, he maintains that our independence as a maritime power, as far at least, as regards supplies of timber for our navy, is bound up (in case of a war with the northern powers of Europe) with a due protection and encouragement of the Canadas. The dense forests that cover great part of the surface of these possessions, are also a mine of wealth as an article of traffic, to England. We shall extract a few of Mr. Martin's descriptions, respecting particular kinds of trees abounding in these Colonies.

The principal timber trees of Canada, are, in the low and light sandy soil, almost every species of pine, with cedars and swamp ash. The dry and more elevated land yields oak, elm, ash, and birch of various kinds—maple, wallnut, cherry (various kinds), hiccory, hazel, iron-wood, thorn, &c. &c. The pines and firs are the great staple of the forests. We quote what is said of the balsam spruce, on account of its curious usefulness.

"A beautiful evergreen tree, in open situations feathered to the ground, and rising in a pyramidal shape to the height of thirty feet or more; and, on these accounts, much planted for shrubbery and park scenery in Great Britain. The famous *Canada Balsam* is procured from this tree; it is found in small blisters in the bark, extracted by incision, and received in a limpid state into a shell or cup.

"Perhaps there is not a better varnish for water-colour paintings, than that which is prepared from this liquid resin. The branches of this, as well as the hemlock, are used by the Indians, and Canadian voyagers, to sleep upon. In their winter voyages, they scrape the snow into heaps with their snow-shoes, making a kind of snow wall on each side of their lair, then

strewing the ground with branches, wrap themselves in their blankets, and thus sleep, when the thermometer is many degrees below zero. In this way, between two Indians, did Captain Thompson sleep, in his unsuccessful attempt to overtake Captain Franklin in his arctic journey."

When one considers the severity of winter in Lower Canada, even without reference to the rapid and extreme heat of summer, it could scarcely be supposed that such luxuriant vegetation could exist in the province as distinguishes it. The fact must be accounted for by the rich alluvial nature of the soil, which has for ages been unmoved, and on which has been accumulating for centuries successive layers of leaves, and other vegetable matter, until a fertilizing manure has covered the earth to a depth of several feet. Just let us see what is said of the strength of growth exhibited by the white pine.

"This tree, called in our English parks the *Weymouth pine*, is the most majestic of all the Canadian pines, and, with the exception of some of this family found in the neighbourhood of the Columbia river, on the north-west coast of America, reported to be 250 feet high and 50 feet in circumference, towers over all the trees of the forest, being occasionally found of 150 feet in height, and 5 feet in diameter at its base. When growing in open situations, it is feathered to the ground, but, as generally found in Canadian forests, is little more than an immense stick, with a certain quantity of brush at its head, in about the same proportion as the hair on the tail of an elephant. It is of this tree, of which, in general, the forests of all British America are composed; and is, in fact, peculiar to America, a similar tree not being produced in Europe. It is a most universally used and valuable timber, being also the cheapest, and is called in commerce *white pine*, *yellow pine*, or *American pine*; the quality and size vary with soil and situation, and equally so the value, according to the manner in which it is converted or manufactured; that is, as to straightness, size, and the equal, smooth, and parallel cutting of the sides. It is of immense size, of small specific gravity, very free from knots, and easily wrought. These properties, as may be supposed, ensure it an immense consumption, being equally in repute for the largest masts of our men-of-war, and the smallest article of carving, or inside decorations of our houses; it may be called, *par excellence*, the carpenters' and joiners' wood. The Americans use it by preference for ships' decks, as it resists the sun, is not brittle, and will not allow water to run through, being not liable to crack or split. In general, too, it is preferred by them for works under water, or for water courses, or "dalls," as they are called. When properly applied and treated, it is as durable a wood as any other of the pine family, but, when improperly applied and treated, it is very apt to engender dry-rot."

Some of the white pines, as being yellower in colour and mellower in quality than others, are particularly in demand for musical instruments.

But American pines serve other than these slight and tiny purposes.

"Were it not for the supply from Canada, government could not procure masts for our large ships of war. They are contracted for as large as thirty inches, that is, ninety-nine feet long, thirty inches cube at fourteen feet from the base, and measuring twelve loads eighteen feet each when dressed. Trees affording such stems are rarely found, and with immense difficulty are they brought down to the rivers. Roads of considerable length are of necessity cut through the woods, for this purpose, from the locality of the tree, to the river, at an enormous expense; even for common timber of merchandise, not one in ten thousand is fit to cut. The establishment of a first rate "Shanty," as it is called, (from the Fr. "*Chantier*,") to cut masts, is a matter of no small magnitude or expense; it must be commenced by the first of October for the next year's supply. The party occupied therein are generally from thirty to fifty men, having as many oxen and nearly as many horses. The provisions and provender for both the men and cattle, fully ample for seven months, has to be forwarded to the establishment from Montreal at an astonishing outlay, consisting of flour, pork, molasses, rum, beer, oats, hay, &c. &c. as well as clothing, blankets, flannel, shoes, boots, axes, chains, saws, &c. &c. The *advance* altogether for such a Shanty is little short of £2,000. It is from the large requisitions for these Shantys, that the lumbermen are considered the pioneers of improvement; because at two hundred miles' distance from Montreal, the carriage of such an immense material against the currents of the rivers, with rapids and falls to overcome, offers a temptation for agriculturists to follow them as closely as circumstances will admit."

The Canadian oak is not so durable as that of Britain, the fibre not being so compact and strong. The birch tribe are numerous, and the sap, drained in March and April, from all the varieties, makes excellent vinegar, or a pleasant weak wine may be obtained by boiling and fermentation.

"The American maple is a beautiful tree in all its grades; that called the *bird's eye*, takes its name from its mottled hue; the *curled maple* is richly shaded in fibres, admits a high polish, and forms the ornamental work so much admired in the American packets. It is from a variety of the maple *(acer saccharinum)*, that the celebrated maple sugar is made; the production of which, in Lower Canada, is about 25,000 cwts. annually. The tree is large and shadowy, with richly tinted autumnal foliage, and esteemed as timber for strength, weight, closeness of grain, waving fibre, and susceptibility of polish. The sugar is extracted by evaporation from the sap, which it yields abundantly when the bark and wood is wounded in spring; one tree yielding from a pint to two gallons per day. A plantation of maples is termed a *suegari*, and is justly considered valuable, as the sugar is rich and pleasant to the taste, and sells from 3*d*. to 6*d*. per pound."

We might go on and present to our readers many other curious or valuable specimens of the vegetable kingdom, as given by Mr. Martin. For instance we are told that the Nuns of Canada prepare a vegetable plaster which, it is said, never fails to cure inveterate cancer; but the secret of preparation has not been divulged. One of the most remarkable facts spoken of, is, that in America, as also in New Holland, and other heretofore untilled countries, whenever the original forest is burnt or cut down, trees of a different species spring up, but seldom any of the sort growing previously to the application of fire. Thus also, on the Malabar coast it is necessary to burn down the Cardemom and other spice plants, before young trees will spring up in their place. In Canada indigenous grasses, not heretofore seen, spring up after the land is cleared of wood, and the banks of the Slave Lake, formerly covered wholly with spruce, fir, and birch, when laid waste by fire, produced subsequently and spontaneously poplar, which had not been before seen. We have only room to add to these curious facts, the general truth, that the whole of creation teems with life, and that too in its most variegated forms.

*The Fruit Cultivator; being a practical and accurate Description of all the most esteemed species and varieties of Fruit cultivated in the Gardens and Orchards of Great Britain, &c.* By JOHN ROGERS. London: J. Ridgway and Sons. 1834.

THIS work, the author states, differs from many others which have preceded it, chiefly in this—that whereas former works only give general directions as regards the management of the different species of fruit trees, this enters into minute details, not only respecting the species, but of every variety and sub-variety which he has found to be really worth cultivation. He is now in his eighty-third year, and during an active and varied lifetime of employment, it has been his custom to keep notes of the result of his practice. This volume contains these in a condensed and arranged shape, which he offers to the young gardener and nurseryman, believing that it contains a fund of information not unworthy of notice. The whole, he continues to state, is derived from actual practice, and nothing is advanced of which he cannot vouch for the truth. All this the work indeed of itself testifies; and we may add that the whole is delivered in the plainest manner and language—botanical or scientific terms being carefully avoided.

After a few observations regarding the sweet and bitter almond trees, which he considers the least valuable of all our wall fruit, he proceeds to the common apple, certainly, as the author maintains, the most useful kind of fruit cultivated in Britain. Its characteristics of hardiness, beauty, wholesomeness, whether as food or drink, the earliness of some varieties, and the long-keeping properties of others, render the apple one of the choicest gifts of nature. Yet the wild crab of our hedges is the only fruit of the kind of which this country can boast as being indigenous; from this, however, all the improved varieties here or elsewhere have been obtained, through the agency of human art and industry. But notwithstanding the very many sorts of apples which have, and lately too, been produced by art, not one, says the author, surpasses, or even equals two of the oldest varieties in our orchards, viz. the old golden pippen and nonpareil for the table, or the old royal russet for kitchen purposes.

A subject of great importance is adverted to in these pages, in the usual plain and practical manner of the author; this is regarding the choice of stocks most proper for the character of the tree about to be propagated. We cannot well abridge the following account.

"*The Crab Stock*—Is allowed by all cultivators to be one of the best; not only because it is naturally hardy and durable, but because it is less liable to suffer from canker. These stocks are procured by gathering fruit from the most healthy trees found wild in the woods; extracting the seeds; keeping them dry until the time of putting them into seed-beds in the nursery. Another stock recommended by Mr. Knight is also found very useful, especially in cold situations or climates. This is raised from seeds of the yellow Siberian crab, and promises to be a very proper stock for many of our smaller sorts of table and cider apples.

"*The Tree Stock*—Is raised from the seeds of any kind of cultivated apple. Much more care is necessary in selecting these seeds than is usually bestowed. In this country they are too often sowed, and raised promiscuously: a plan by no means to be approved. The French orchardists, particularly in Normandy, are very careful in keeping their tree-stocks separate, and working upon them only such sorts as they think will best answer the end in view; that is, uniting early grafts with early stocks: late sorts upon stocks raised from late varieties, &c. By such means the real character of the different kinds is kept more pure, both as respects quality and long keeping properties, a practice well worth imitation. The next to be mentioned is—

"*The Paradise Stock.*—How the name originated has not come to the author's knowledge; but it is a most suitable stock for dwarfs and espalier trees. Its own fruit is of no value, and is therefore universally employed as a stock. By all accounts it is of Dutch origin, though it first found its way to England through France. It has however been long ago proved by the late Mr. Grey, of the Fulham Nursery, that the French is inferior to the Dutch paradise stock, especially for espaliers. For this purpose, and for dwarfs in small gardens, this stock is most eligible; though the author is of opinion that it is less durable than the crab.

"*The French Stock.*—This is a very diminutive growing plant, and is chiefly used for trees intended to be kept in and fruited in pots. This method of growing apples is practicable; but even when successful, the trees with their fruit are more objects of ornaments for tables at great entertainments than of any real use: the fruit being both mealy and flavourless.

"This stock as well as the paradise are best raised from layers, particularly the Dutch, few of the other being raised in this country, in consequence of the facility with which any quantity can be had from the continent. The paradise stocks affect a moist, rather than a dry soil."

Of the soil most suitable for the successful culture of the apple, we are told, that in the three British kingdoms, a soft hazel loam, containing a small portion of sand, seems to be the most congenial. A great depth is not necessary; eighteen or twenty inches being quite enough, provided it be on a dry subsoil of chalk or loose rock. For though writers have recommended deep rich soils in sheltered situations, the author has not found them most proper for the apple. The planter, however, where the soil is not such as recommended, must endeavour by trenching, draining, and by the addition of the qualities wanting, to bring it as near the standard as possible. When the roots take an extensive horizontal range, the young wood of the tree is always of more moderate growth and better ripened than where they strike deep into the ground. An orchard should neither be in the bottom of a narrow valley, nor on the top of a hill. The side of a gentle slope towards the south, or south-east is to be preferred. But on all occasions the author insists that the roots should be invited to keep near the surface, which can only be done by applying top dressings of suitable compost; and not disturbed by the spade for the purpose of raising crops of annual vegetables. After several other matters necessary in the judicious management of apple trees, described in a general way by the author, both as respects orchards and gardens, which he considers as only introductory to what is of more practical value to young cultivators, for whose sake the volume was projected, he comes to the points chiefly contemplated, viz. faithful descriptions of all our best hardy fruits. Respecting the different apples, he gives a catalogue to the amount of nearly one hundred and fifty sorts, familiarly described, with practical observations on their culture, value, and history, with other particulars necessary to be known by every cultivator of this useful fruit. We of course can only extract one or two of the sorts as here given. The one first mentioned is the hawthornden.

"Reader, be not surprised at seeing this placed first on the list. Europe has not produced a better or more useful apple for all culinary purposes. It deserves precedence on many accounts: as an early and prolific bearer, as a free-growing and healthy tree, it has scarcely an equal. The fruit are fit for use from the time they are of the size of walnuts till they are ripe in October. When full grown, especially if the crop has been thinned, the fruit attain a large size—say from eight to ten inches in circumference—and continue good in the south of England till the end of December. In colder countries, or in cold seasons, they keep much longer. In Scotland, the fruit sometimes keep till the month of May. If the ribstone pippin be esteemed the glory of Yorkshire, the hawthornden certainly deserves to be called the glory of Scotland.

"The fruit is generally above the middle size, round, a little flattened, with a few irregular risings. The pulp is light-green, solid, and abounding with a fine acid juice. The shoots are strong, and of a lightish-brown hue, having the buds prominent, leaves large, and a little hoary. The tree, if worked on a paradise stock, begins to bear in the third year from the graft, and is rarely barren afterwards. Although of vigorous growth,

the tree seldom attains a large size; the branches mostly inclining downwards, in consequence of the heavy crops.

" Another advantage belonging to this variety of apple, is its thriving in almost any soil that has not a decidedly wet bottom ; and may be planted as standards or as dwarfs, either trained on espaliers or in any other manner. If intended for grazed orchards the stems should be higher than usual, in order that the hanging branches may be out of the reach of cattle.

" Any stock may be used for this apple ; but for small gardens, the paradise stock should always be preferred.

" The hawthornden was early introduced into the Fulham nursery, whence many of the markct-gardeners round London were supplied. About the same time it was introduced into Cambridgeshire by the late Lady Hardwicke, and extensively planted in that county, as well as all over the three kingdoms.

" It is also to be remarked of this tree, that it is less liable to be infested by the mealy aphis, or American blight, than most other apple trees ; owing, no doubt, to its more robust habit of growth."

Of the tribe of apples called nonpareil, take the following notices :—

" Nonpareil is the name of a favourite and well-known apple. It is a sort which has attracted more than ordinary regard ever since it was first in cultivation : consequently, many pomologists have experimented upon this kind of apple, either with a view to obtain better sub-varieties, or progeny equal in value to the original. The consequence of these experiments have been, that we havc now in our lists not less than six subvarieties of this fine apple, besides the original old one ; and they being desirable sorts, the author has thought it expedient to describe them together, in order that their merits respectively may be more readily perceived, and comparisons easier made.

" *Summer or Early Nonpareil.*—This variety is in season from the end of August to October. The fruit is about the middle size, rather flatted, the eye small, and somewhat prominent ; stalk long and slender ; colour dull green, intermixed with a little russet round the stalk, and dashed with a faint red on the sunward side. The flesh is crisp, the juice, though not very abundant, is rich and well-flavoured ; therefore fit for the table. In growth, the tree resembles its old progenitor ; the shoots not however so slender, and generally well set with prominent buds ; it makes a handsome standard of the third class in the orchard, and beautiful little dwarfs or espaliers when worked either on the paradise, free, or crab stock. The tree requires a sheltered situation, and the soil which suits this, as well as all its congeners, is a light, rich loam, on a dry subsoil. In heavy wet soils, they soon become cankered, and fall to decay. This is also called Lacy's Nonpareil.

" *Scarlet Nonpareil.*—One of the most beautiful of its family, and fit for use from Christmas to March. The fruit is nearly round, of a fine deep red next the sun, and dark green, turning at last to yellow, on the other. The eye is larger and more hollow than its parent, and the whole fruit is also larger. The pulp is very firm, the juice rich and abundant ; but inferior in flavour to the old sort, though it comes nearest to that fruit of any of its varieties. The tree is hardy, and makes a good orchard tree of the second class. If grafted on the paradise stock, it bears early, and yields fair fruit ; but they do not keep so long, nor is the flavour so high, as when grown on the crab stock.

" To the market gardener who happens to have a light dry loamy soil, this sort of apple would doubtless pay well ; the fruit being frequently sold in Covent Garden Market towards the end of February, at two guineas per bushel !

" This is one of the best apples which have been raised from seeds within the memory of man. The late respectable nurseryman of Kensington, Mr. Grimwood, senior (now Malcolm and Co.), had the good fortune to detect this apple in a garden at Esher in Surrey. From the original tree Mr. Grimwood had his grafts, and sold many of the young trees at a good profit. The sort, however, soon got into the hands of the neighbouring nurserymen, who have distributed it into every quarter of the three kingdoms.

" *Braddick's Nonpareil.*—In perfection from the end of November till February. A very excellent little dessert apple, raised by a worthy gentleman whose name it bears. The fruit is of quite the nonpareil shape, but the stalk is different ; for, instead of being long and slender, it is very short. The colour is a mixture of green and russet, tinted with faint red next the sun. The pulp has a yellowish cast, crisp, and filled with a rich pleasant juice. The tree is not a rank grower, but may probably rank in the third class of the orchard. For garden planting, it may be treated like the other varieties of the family, and deserves a place in every collection, as it is certainly a good bearer.

" *The Old, or Original Nonpareil.*—No orchard fruit has been more valued than the nonpareil. The musky excellence of its flavour, and its long-keeping property, makes it universally desirable, whether for personal use and gratification, or for sale. The tree is diminutive in stature, and of weakly growth, never reaching higher than the third class in the orchard. When it is required in the garden for dwarf training, it should be on the paradise stock ; if for espaliers, work it on the crab. The best soil for it has been already repeatedly mentioned, and in which it continues to thrive for a great number of years. Many trees, now in good health and full bearing, are known to have been planted fourscore years ago.

" That the nonpareil is of French origin, is highly probable ; it being mentioned in a catalogue written by Merlet, one hundred and fifty years since. Merlet was followed by Duhamel, who describes the fruit as being of a green and grey colour, &c., and much esteemed in England ; having no doubt but that the apple he describes is identical with our nonpareil of the present day.

" Of late years, it has been observed, that the nonpareil has not kept so well as formerly ; this, there is little doubt, is caused by the tree being too frequently worked upon the paradise and free stocks, instead of the true crab. For there is no fact more fully ascertained by nurserymen than this, that the crab stock is more congenial to every variety of apple than any other ; having a less tendency to alter the natural properties of the graft, and assisting the latter to display itself in its proper form of head, as well as maintaining the true flavour and keeping qualities of the mature fruit. The paradise stock may be used to induce a more dwarfish habit, and earlier fruitfulness, and the free stock to produce a contrary result ; but the crab stock only can be trusted to for the development of genuine character."

That the author is a utilitarian writer is sufficiently evident from these specimens. His directions concerning the gathering and preserving of fruit are remarkable for their simplicity and their address to common sense.

" That there is a proper as well as an improper time of the day for gathering summer fruit of all kinds, is not perhaps so generally known as it should be ; and that there are improved methods of preserving it when gathered, will be readily admitted by all who wish to have it in perfection. This is a necessary part of the knowledge of those who have the charge of the fruit room ; and as the author has had much experience in this particular of the gardener's business, he has to offer a few directions thereon, which he trusts will be acceptable, especially to his young readers.

" All summer fruit should be gathered in thc cool of the morning. They are then more juicy, and higher flavoured. If gathered in the heat of the day, they are vapid, and not half so refreshing to the palate as when gathered before the sun has much power.

" Fruit baskets should be made of any light material, chip or wicker-work, either round or square, with cross handles ; and with rims about two and a half inches deep. There should be one for each kind of fruit, and covered within with vine leaves to receive them singly, as gathered. This refers to all fruit

which are gathered from the tree on the day they are to be used ; such as early apples, pears, plums, peaches, &c. Some kinds show when they are ripe by their colour and transparency; some by their scent, but most of them by the case with which they quit their hold of the trce. Handling them to judge of their ripeness is a bad custom ; because the least pressure of the thumb and fingers is sure to injure both the appearance and quality. Almost all kinds ripen unequally : the firstlings must be picked as they are ready; but if they quit the tree spontaneously as soon as ripe, the whole should be gathered together a day or two previous, and laid singly on thin layers of clean straw, dry fern, or moss, on the shelves of the fruit room. Early kitchen apples may be laid in small heaps, and lightly covered to exclude the air, in which state they will keep longer than if lying exposed.

" The shelves for fruit should be made of some scentless wood : white poplar, beech, or wainscot oak is best. Deal is apt to impart a resinous scent. A fruit room should be a cool place, and capable of being kept free from the changes of weather ; an equal temperature is of the last importance for the keeping of fruit ; and for which purpose the windows should be fitted up with well-made shutters.

" Before the winter fruit are laid on the shelves, each sort should be carefully gathered when dry, and laid in separate heaps on the floor of the room, and closely covered up for eight or ten days, not longer. After this time they should be each wiped with a clean cloth, laid on the shelves upon straw singly, and covered with a thin layer of the same.

" All fruit intended for keeping, should be gathered *just before*, rather than after they are ripe ; this does not prevent their perfect ripening, and prolongs the period of their keeping.

" There are several other modes of keeping fruit which may be mentioned; viz. first, in jars, or in any other air-tight vessels, embedded in sand. For this manner of packing fruit, the finest sand should be procured, and thoroughly dried in an oven ; a layer of sand is first put in the bottom, on which a layer of fruit (the eye towards the side) is placed and covered with sand ; next a layer of fruit, and so on alternately till the jar is full. The fruit are so disposed, that no two touch each other : and when the jar is filled and shaken down, it is plugged or bunged up, covered with wax, and tied over with bladder, or white leather, on which the name of the fruit is written. The jars are stowed away in a dry cellar ; and in this way apples and pears have been preserved good for twelve months.

" Pitting apples, like potatoes, has lately been practised, and succeeds very well. It is a German custom : and when there is no other convenience for storing the fruit, it may be had recourse to. Choose a perfectly dry spot of ground, dig out a trench five feet wide, of any required length, and one foot deep from the natural level of the ground. After the sides are sloped, cover both them and the bottom with turf, the grass side outwards, on which the fruit are laid, two and a half feet thick, but highest like a ridge along the middle. The apples are then covered closely up with turves, the grass side next the fruit: and over all must be laid a covering of dry earth one foot thick. All the best keeping apples may be preserved in this way till the months of March and April ; but it should be observed, that they remain sound but for a very short time after being taken from the pit. Protecting the fruit from the action of the air and changes of weather, is alone necessary to prevent their decomposition.

" There is another very simple way of keeping apples sound, as practised by the author. In a day or two after gathering, let each apple be wiped perfectly dry, wrapped in thin white paper, and packed in a box or basket, with straw at bottom, sides, and on the top. Thus packed, they are placed in a dry, airy room, where they keep extremely well. Apples may be kept by art much longer than pears ; but these last may be preserved for a month or two over their time by jar-packing, and placing them deep in the ground."

The apricot is next taken up in these pages, which, as every one knows, is the native of a warmer climate, and requires the warmest situations that can be given it in this country. The stocks from which this fruit has been most successfully raised by the author, are two or three sorts of inferior plums ; such as the muscle, the Brussels, or St. Julien, and the common plum stocks. It appears to us that what is here said of the apricot, and the sorts which the author can confidently recommend as having been for many years under his personal management, is particularly worthy of every young gardener's study. The same thing may be said of the remarks on garden walls. These parts of the volume we must however leave, that an extract or two may be introduced regarding some others of the fruits most familiar and interesting. But this hasty notice is the less to be regretted, since from the quotations made, any person may appreciate the character of the work ; and as it is *multum in parvo*, for six shillings, many, no doubt, will from what is here seen, avail themselves of its entire information.

When speaking of protecting the early flowers of fruit trees, the author of course takes notice of blossoms which come forth early in the year, and before night frosts are over.

" But there is another object in using coverings for early flowering trees, which the author particularly recommends to the attention of the young gardener : it is this—the delicacy of all early flowers, it is well known, renders them liable to be destroyed by frost ; but few people suspect that they are also subject to be withered and killed by a hot sun : but this is really the case, and therefore the flowers require shading in the middle of the day, as much as they need a covering on nights. This is a portion of the gardener's duty which is too little practised, but never should be forgotten.

" It is the rays of the sun too that is the destruction of plants that become frost-bitten during the night. For if such be allowed to thaw in the dark, no injury follows ; or if the frost be thawed off by water, before the sun shines upon the frosted plant, no damage ensues. This appears to be a dangerous experiment, especially on trees which are covered with blossoms ; but as it is recommended by Miller, and constantly practised by very many eminent horticulturists, there appears to be no doubt of its efficacy.

" Defending fruit trees from frost, has formerly been only allowed to the peach, nectarine, and apricot; but it is equally necessary to all other early flowering trees ; as the May duke cherry ; précoce de Tours and other plums; and all the best pears cultivated on walls. These also require shading from a hot sun in the middle of the day ; as it may be safely averred, that in early sun-shiny seasons, as much fruit is withered and lost by the action of the sun in the day, as is killed by frost in the night.

" In the culture of the apricot, and almost all other kinds of fruit, thinning an over-abundant crop is absolutely necessary. The proper time for this defructification is just before the stone gets so hard as to render the fruit useless for pies and puddings. In the business of thinning, the largest and best placed fruit are left, and all the underlings and the worse placed ones are taken away. The age, or rather the vigour of the tree, directs the thinner as to the number to be left ; two on every square foot of the space occupied by the tree, will be a very fair crop. A young, or a weakly growing trec, should not be allowed to ripen half that quantity ; but on strong old trees, a heavier crop may be left ; especially if wanted for marmalade, or jam, or for preserving.

" The above observations, though chiefly applicable to the apricot, are also referable to other kinds of wall fruit, hereafter to be described."

We select a few most important general observations regarding the gooseberry ; for though it be universally cultivated by peer and peasant, like many other most familiar things, it is not to an equal extent thoroughly understood.

" The gooseberry is a native of Britain ; and none of her native fruits (except perhaps the plum) has been more improved by culture than this. In its wild state it is a small, rough, taste-

less berry; but under cultivation has been brought to high flavour, and great magnitude.

"Besides its uses as a table and kitchen fruit, it is when half ripe, capable of yielding a juice, which after fermentation, and a little necessary compounding, forms a liquor resembling (if not sold for) 'sparkling champagne,' much superior to the common wine made of the ripe fruit.

"Miller in his Dictionary, published in 1743, mentions only six or seven sorts, but admits that many more varieties raised from seed were in existence at that time. Indeed, from information received by the author in Cheshire, he has every reason to believe that gooseberry shows were held in that or the neighbouring county as early as the date of the Dictionary alluded to.

"Previous to describing what are now considered the leading sorts, a few observations may be offered respecting the culture of the gooseberry.

"The best soil is a fine fresh loam, neither too heavy nor too light, eighteen inches or more in depth, and if resting on a subsoil of clay so much the better. Dunging every second or third year is necessary; but it should be considered, that giving it in excess, though it encourages the growth of the tree, and enlarges the size of the fruit, it deteriorates the flavour.

"Gooseberry trees, when planted in rows, should not be less than six feet apart. When planted in quarters, the distance is optional. An open situation should always be chosen; for if under the shade of trees, the fruit are never so high-flavoured.

"Gooseberries, like the currant, may be forwarded by having places on walls of different aspects, as well for expediting their ripening, as for the convenience of covering the fruit from birds and weather. Low paling is sometimes used for the culture of this fruit, and which answers extremely well; as the flowers can be easily guarded in early spring, and the fruit in autumn.

"If young bearing plants are potted, after being established for one year they may be forced successively in a moderate heat. Like other potted fruit trees, they require frequent supplies of manured water."

We close this volume after extracting the conclusion of it in the words of the author, which from their modesty and earnestness, offer a better recommendation than any thing that could be uttered by any one else. We must, however, once more declare, that the little work is full to overflowing of pithy, shrewd, judicious, and practical lessons, given in the most familiar and intelligible form, remarkably well calculated to furnish young cultivators with a pocket companion. The author has done much in an unpretending shape, to further the culture of these fruits, which serve for the regalement of the rich, and are often obtained for the comfort of the poor.

"Here ends the description of nearly five hundred species and varieties of orchard and garden fruits; nearly all of which have been propagated and cultivated by the writer himself, or under his immediate inspection. He dare not pretend to say that his opinions are infallible, or that his advice is the very best that can be followed, because, in an improving science like that of gardening, every day brings forth something new and valuable to be added to the old stock of knowledge; but he can avow with great truth, that the results of his own practical experience are faithfully set forth; and can promise those, whoever they may be, and particularly the young gardener, that in so far as the writer is considered a preceptor, his followers will not be disappointed. He will not be accused of improper vanity, if, on the principle—'in the multitude of counsellors there is wisdom,' he thinks that his knowledge, gained during a patriarchal life of eighty-three years, may be a useful addition to what has been heretofore written on the same subject. His great exemplar and friend, Philip Miller, trod the higher walks of the profession, and enlightened posterity with his pen. His humble follower took a lower though not less useful flight, and has in the preceding pages, in imitation of his far more exalted prototype, endeavoured to leave behind him something to prove he has not lived in vain."

## GARDENING OPERATIONS FOR FEBRUARY.

THERE is one general truth that should be borne in mind by every practical gardener who looks into a calendar for specific directions regarding any one month of the year. It is this: that in the same degree of latitude some seasons are three weeks earlier than others; so that the same works may be performed three weeks sooner or later, as may suit the kind of weather that falls out. It may therefore happen that what is directed to be done in any given month may be equally well done in another. It is equally plain that the practical gardener must, in a great measure, be guided by his own skill and experience, according to the latitude in which his business lays. But at the same time it will be found that our directions, in the hands of such a person, will be found applicable to any part of the united kingdom of Great Britain and Ireland.

### THE KITCHEN GARDEN.

In this department for the above month, if settled, open weather prevail, considerable attention is required relative to the preparation of all vacant ground, by dunging, digging, and trenching, &c., and of hot dung and other materials for hotbeds. A prospective look must be had now, and during the next month, in a particular degree, to the business of the whole year; that all may be in proper order, ready for sowing and planting the principal early and main crops; some to attain early perfection in the same spring and beginning of summer; but considerably the greater part of the main crops for the general service of summer and autumn, and many also for the winter.

*Cauliflower* strong plants, if the weather be mild, about the end of the month, may be transplanted into the situation where they are to remain, at the distance of two feet and a half each way from one another, in well manured ground and a warm situation; some cauliflower seed may be sown any time this month to produce plants to succeed those that have been preserved, or to supply what has been cut off by severe weather. *Cabbage* plants of all sorts, if tolerably strong, should be transplanted. About the middle or towards the end of the month, sow some cabbage and savoy seed to raise plants for late crops. *Peas* of the different sorts may be sown. The low growing ones require about four feet between the rows, and the tall six feet. *Radish* and *lettuce* seeds at various periods should be sown. *Beans* of the broad sort should be planted in rows four feet apart. *Spinach* should be sown to succeed that of last month. *Carrots* of the early horn kind are now suitable for a warm border, or on a hot-bed; and as carrots and parsnips may both be sown about the end of the month, if the weather be favourable, on a general scale, let it be observed that they grow best on a sandy, light, deep soil. *Onions*, on a full crop scale, may also be sown, if the weather be open; and the proper ground is that which has been manured in autumn, and laid up in the winter in ridges. When levelled in this month, let it be broken small, mixing it well with the dung; and if the land be of a strong loamy nature, tread it all over with your feet after the seeds have been sown, and then rake it smooth. We have known the scrapings of a public road produce excellent crops of onions, when thickly laid on the most moorish land. Curled *parsley* may be sown in drills, on the edges of borders, or on quarters, about twenty or thirty inches row from row. *Horseradish* may be planted any time this month in the following manner. Let trenches be dug as if for blanching celery, a foot or eighteen inches deep; then take slips or buds of the roots and plant them three or four inches apart. As they advance in growth, earth them up as is done with celery, laying it light and well broken to the plants. *Radishes* may be sown in a south border or warm quarter, and in an open situation for main crops. Cover early radishes with straw during the night and frost. Admit air daily to those in the hot-beds, give water, and thin them if necessary. *Garlick* and *shallots* may be planted by cloves and off-sets of the roots in beds. *Potatoes* of early kinds may be planted in a warm dry situation and in hot beds. They should be five or six inches deep in the ground, that is well

manured. *Seeds* of marigolds may be sown, as also of burnet, angelica, bonage, cardus, and coriander. *Mushroom* beds may be made, to produce in spring and summer ; cover mushroom-beds constantly with straw, a foot thick, and put mats over the straw. Collect spawn where it appears in decayed old hot-beds or dung-heaps, for spawning new beds. Early Dutch *turnips* may be sown in a warm border, or in a hot-bed. Plant or leave some of the best old turnips for seed. Tops now beginning to shoot are good and tender for boiling. *Jerusalem artichokes* may now be planted by cuttings of the root, in rows, of two or three feet distance, three or four inches deep, and a foot, plant from plant. Small *sallad* may be sown in a shallow drill between the rows of peas or beans. *Seakail* may be advantageously earthed up in open weather. If they are to be forced, dig a trench all round them, about three feet wide and thirty inches deep, fill it with hot dung, and as it sinks raise it. If hand lights are set over the plants, this will hasten their growth. Sow hyssop, summer and winter savory, thyme, marjorem, sweet and bush basil, fennel, sorrel, &c. The basil and marjoram should be sown in pots, and set into a hot-bed or forcing house.

### THE FRUIT GARDEN AND ORCHARD.

General planting may now be performed in all kinds of fruit trees in wall-trees, espaliers, and standards. Those transplanted from one part of the garden to another, if carefully dug about, may probably be removed with balls of earth at them, and in that case the removing will not retard their growth so much as if no earth attached itself. However, if trees are taken out of ground not so good as that into which they are to be put, they had best lose all this adhering earth. The *peach, nectarine,* and *apricot* trees, which are to be finally pruned and nailed in March, should be now examined, and all shoots or branches that are evidently of no use, should be cut off. Every part of the tree should be examined, to detect canker, and cut off those parts that are infected with disease of any kind. *Cherry, plum, pear* and *apple* trees, that were not finished last month, should be pruned and nailed in this. *Vines* in general, both against walls and in vineyards, should be completely pruned and nailed now. *Fig-trees* deferred till this season, should now or next month be wholly pruned or nailed. Pruning of *currants* and *gooseberries* to be finished. This is also a proper time to make a full plantation of them. Trees with full heads will bear in the same year. *Raspberries* may be pruned. Clear away any litter about them and wheel in dung, to be dug in on the first opportunity. But if the weather be cold these plants should not be pruned till next month. All these sorts of berries may have their cuttings now put into the ground to raise a supply of young plants. Of *strawberries*, new plantations may yet be made. Clear the old beds of the runners, and if necessary lay fresh earth among them ; loosen the ground between the plants, mixing in the fresh. Every kind of fruit tree that requires manure and digging around, should now have these helps. Standard trees newly-planted, should be supported. Great attention is necessary in behalf of all plantations of standard fruit trees for the first three or four years, as regards the formation of their heads, and this is a proper time to look closely into them. Defend the *blossoms* of principal wall trees, by mats, in cutting frosty weather. *Grafting* may be commenced upon apples and pears, plums and cherries.

### THE FLOWER GARDEN AND PLEASURE GROUND.

Bulbous roots of all sorts to be planted if the weather permits in beds or borders, or in pots. *Annual* flower seeds of the hardy kinds may be sown in the same various places ; the tender sorts in hot beds. *Anemonies* and *ranunculeses* may be planted in open dry weather either in beds of light earth, each sort separate, or in the principal borders in small patches. Some of these roots may be put into pots for moving occasionally. Defend beds of *curious bulbs*, having them arched over and covered with mats. But in open mild weather, let them always enjoy the air. Dress and give fresh earth to plants in pots in mild weather ; or those wanting larger pots may be shifted. *Auriculas* and *carnations* in pots of the more curious sorts to be continued in a sheltered situation, or in frames, or under hooped arches. *Perennials* and *biennials* of most sorts may now be plantnd where required ; propagate perennials by slips, offsets, and parting the roots. *Flowering shrubs* of all sorts may now be planted in open weather, for shrubberies and other ornamental plantations. *Evergreens* may also be planted. Shrubberies and flower borders should be manured once in two or three years ; and this is a good month to do so. Vegetable mould or very rotten dung is the best for this purpose. *Herbaceous perennials* may be propagated ; the stronger sets in flower borders flower in the same year ; the smaller put in nursery beds, for next autumn. *Suckers* from roses and other sorts of flowering shrubs may be planted. *Box* and *thrift* for edgings may be also planted now ; also daisies, pinks, London pride, &c. Repair old edgings. *Grass lawns*, &c. pole and roll in dry open weather. Lay grass turf for new grass work, or to mend deficiencies ; or sow grass seeds to supply more herbage. *Gravel walks* to be weeded, rolled, and swept in dry open weather. *Prune* shrubberies, and dig them ; tie up those that require it, and clear the borders of any thing that would hinder them being dug neatly. About the middle or latter end of the month, cedars, lauri-tinus, firs, cypress, junipers, hollies, yews, evergreen oaks, arbutus, pyracanthus, with almost all other sorts of evergreen trees and shrubs may be planted, if the weather be mild. *Hedges* may now be planted for fences, shade, or shelter of deciduous or evergreen kinds, clip and trim them. *Ten-weeks* stocks and mignionette may be sooner in a hot bed or pots, to be sheltered from the cold.

### THE NURSERY GARDEN.

At any time of the month make plantations of stocks, on which to bud and graft different sorts of fruit trees ; plant them in good well-trenched ground, thirty inches or three feet, row from row, and about eighteen inches, plant from plant. But the small plants should first be planted out in beds. *Seeds* of many sorts of trees and shrubs may now be sown, in beds of light mellow earth, three or four feet wide ; the seeds being different in the various sorts may be sown some broadcast, earthed over one or two inches deep, and the larger sorts in drills the same depth, or other large kinds may be planted by dibble. Trees and shrubs of all sorts may now be *propagated* by layers and cuttings. Fruit, forest trees of all kinds, and flowering shrubs of all sorts may be in this month transplanted. Pruning, digging between nursery rows, and mulching the ground between lately planted young trees and shrubs of principal sorts, or of curious and tender exotics, to preserve the roots from frost and drought in spring, should now be performed. Though near the latter end of the month grafting may sometimes be performed, it is better to leave it till March. Tender seedling plants in beds should be sheltered in bad weather by hoops and mats.

### THE GREEN-HOUSE.

The general care of the green-house plants, now, consists in supplying them with plenty of free air every mild day, gentle waterings, and to defend them still from cold, by shutting all close every night, and in frosty and other inclement weather. Loosen the earth in the tops of the pots, and give fresh earth where it is called for. Shifting into larger pots may be performed ; and all decayed leaves and dead wood removed. Foulness contracted on the leaves of oranges, &e. should be washed off, by watering over the heads in a fine mild sunny forenoon.

### THE HOT-HOUSE.

Continue always a moderate heat here, by a constant bark-bed ; especially the pinery stove and fires every night and cold days. A high state of heat is necessary for all the exotics and in pineries, as the full grown fruiting pines will be advancing in young fruit, requiring a good bottom heat in the bark bed, and also a moderate fire heat, to forward the fruiting. In general the pine

plants must continue plunged in the bark bed, which should be continued in a lively state, by forking up occasionally, and adding a proportion of fresh tanners' bark; observing, previously to take up all the pots, and if any of the top bark is much decayed, remove it. Mix, level, and tread the new and old tan together; then loosen it again as deep as to allow the pots to be replunged easily. If there is danger of the tan becoming too warm, the pots must not be plunged to their rims. To ascertain the heat, put sharp-pointed sticks into it, and thereby judge. Water, air, and cleanliness must each and all be attended to.

## ON THE CULTIVATION OF THE RANUNCULUS AND ANEMONE.

The cultivation of these two sorts of flowers is so similar, that the general details of the methods adopted for the one, may be considered applicable to the other. They are usually grown on a very rich soil, and according to the opinion of skilful cultivators, they cannot, with certainty, exhibit a fine bloom from the same roots during successive years. In the fourth volume of the London Horticultural Society's Transactions, the Rev. W. Williamson accounts for this fact in the following manner. He says, "In perennial fibrous rooted plants, the strength of the blossoms depends upon the impulse that is given to the plants in the season in which they flower, but not so in bulbous roots; their strength depends upon the quantity of sap that is laid up in the roots by means of their foliage during the preceding year. Now it is generally supposed that the roots of the anemone and ranunculus are very impatient of frost, and they are in consequence, planted so late in the spring that there is not sufficient moisture (which is so very essential in the early stages of their growth), nor even time for the roots to throw out such a sufficiency of leaves as to insure the future strength to the roots, before the north-east winds set in, which in this country have generally prevailed during the month of March, and sometimes much later; these winds, which dry the soil very rapidly, must be prejudicial in proportion to the lightness of the compost; and when roots are stunted in the earlier stages of their growth, the bloom of the present year has but little beauty; no skill can possibly make them exhibit a fine bloom in the succeeding season; and frequently two or three years must elapse before sufficient strength is given them to cause them to blow in perfection."

Mr. Williamson therefore conceives that these roots require not only a rich but a compact soil, and recommends a compost made of stiff loamy clay, enriched by one-fourth of good rotten dung; but yet he considers that if the garden be of a loamy quality, no manure is necessary. His own garden being of a rich hazle loam of about two feet in depth, having a brick earth for the subsoils never fails in producing a fine bloom; but of course his skill applied in various ways, aids the natural powers of the ground. We proceed therefore to extract some parts of his valuable suggestions on this subject.

In October he digs the ground roughly, but not deep, so that the lower part of the soil is not moved at all. The fibres of the roots when planted, soon penetrate this compact soil and draw moisture from it and consequently flourish, whatever may be the state of the upper part of the bed. As we seldom have a second frost of much intensity or duration, he plants the roots immediately after the first severe instance of it, and never after the 10th of February. Before the leaves appear, he usually moves the surface of the ground with a Dutch hoe, to destroy the weeds, and to make the surface light and porous. And after they do appear, a small hand-hoe applied between the rows is extremely beneficial, because it is found that the plants are most prosperous when the upper soil is thus frequently moved.

He has proved by experiments that the roots of these plants are not very much injured by frost, provided the soil is not naturally wet. Seedlings he finds are more able to endure hard weather than our older varieties. When the roots decay, it is not in general during winter, but late in spring, after the vernal rains. He thinks, therefore, that were they protected in the winter and spring during heavy and continued rains, by a covering of sail-cloth raised to some distance from the ground, they might be exposed to the severity of frost without damage. If such be the case, and they are planted before winter, they will not only bloom earlier and finer, but the roots are more numerous and are larger.

He dissents from the general opinion as to the most proper time for taking up the roots, and thinks that it is usual to allow them to remain too long in the ground after the bloom is over. If the sap of the present year, says he, is to afford nourishment for the foliage and bloom of the next, we ought to accumulate the sap as much as possible in the roots. Now the fibres of the roots must begin to decay, before the foliage changes at all, for one is the consequence of the other. Therefore it appears proper to take up the roots immediately when the foliage begins to change, that the sap which is contained in the leaves may remain in the root and not pass into the earth through the fibres that are still attached to it. After lifting the roots he usually washes them, and as soon as they have been dried upon the floor of an airy room, he separates them to be kept for planting.

Of the three ways by which these plants are propagated,—by cutting the roots, by off-sets, and by seed, the last is the only one through which to obtain new varieties. And as it is well known that the seed which is produced from those flowers which are already partly double, is more likely to produce either double or semi-double flowers than the seed from single ones, the first object must be to procure roots which produce semi-double flowers; for were they quite double, no seeds could be had from them, the stamina being entirely destroyed by the impletion. It is bad management, he maintains, that affords cause for the frequent complaint of the difficulty in making the seed vegetate. He gives the following directions. First of all the seeds must be sown early, for moisture is essential to their vegetation; and as they frequently remain six or eight weeks in the ground before coming up, it is necessary to sow early to secure a certainty and a continuance of moisture. He has sown from the beginning of September to the end of January, with various success; the autumnal sowing being preferable, should the winter be mild. He therefore sows half of his seed in autumn, which appears in the beginning of November, and the other half as early as in the month of January as the weather will permit. This last sowing is almost certain to do well, though the roots will be much smaller than those raised from the autumnal sowing, provided the severity of winter has not cut them off. He next attends to the depth proper to be observed for the seed to be deposited in the ground, the least covering being sufficient. Careful weeding must be frequently resorted to. When the foliage decays, which will be early in June, the ground ought to be entirely pared to a sufficient depth and afterwards sifted, that all the roots may be certainly saved, for the smallest most frepuently produce the best flowers. By these methods, he often has raised thousands of double flowers of great beauty in one year.

He continues to bloom the semi-double flowers for several years, as he cannot appreciate their real qualities under two or three years; for though at first only semi-double, they may by skilful cultivation afterwards become double. They become double in two ways; first by the multiplication of their petals; these are obtained at once from seed, and seldom vary from what they were originally; secondly, they become double by the conversion of the stamina into petals. This is effected entirely by culture, and such are generally the fullest and most beautiful flowers; as the colours of the petals thus formed will always be the same as the stamina, which are frequently of a different colour from the proper petals. They are, however, liable to return to their original state, unless great skill and attention be bestowed on them.

1. Elichrysum sesamoides.

2. Solanum stelligerum.

3. Krameria triandra.

4. Solanum Dulcamara.

The increase by offsets is resorted to for perpetuating choice variety.

The cutting of the root into parts is not so well known as a means of increasing these plants as that by offsets. But this method is useful chiefly to preserve any particular variety raised from seed, and of which, only that root is in existence. Several small protuberances will be found on examining the crown of a ranunculus. It is to be observed that the foregoing observations are strictly applicable only to this plant, and the general detail alone, as equally suitable to it and to the Anemone. From each of these crowns a shoot will arise, and the root may therefore be divided by a sharp knife into an equal number of pieces. But such cuttings do not show any blossom in the first year, as they take that time to gain a perfect root.

As particularly regards the anemone, he has the following observations. Convinced that new double varieties might be raised in this country, he endeavoured to procure some semi-double flowering roots, but in this pursuit being unsuccessful, he was under the necessity of raising them himself. Year after year he sowed the seed of the anemone coronaria, but was unable for a length of time to discover the least disposition in the seedlings to multiply their petals. At last he raised a few that had one petal more than the usual number. The seeds of these he saved and sowed, and by perseverance obtained several varieties that had six or seven distinct rows of petals. He expresses himself, besides, as confident, that by continued selection, he should be able to produce double and semi-double flowers of the anemone with the same facility as he did of the ranunculus. How he has succeeded since the account was furnished by him, which we have abridged, is not known to us; but nothing can be plainer than what has now been extracted, or more satisfactory; and therefore, any one may prove whether more can be accomplished or not by following up the method and directions here given.

## DESCRIPTION OF THE PLATES.

### ELICHRYSUM SESAMOIDES.

(Superb Elichrysum.)

Class. Syngenesia polygamia Superflua.

Gen. Char. Receptacle, naked; pappus, hairy, or feathery; Involucrum, imbricated, radiated; ray coloured.

Spec. Char. Leaves linear; branches one flowered, imbricate.

This is not one of those beauties, which meteor like, dazzle the eye and vanish, but one which continues to display its charms from the time of its first budding to the full expansion of its blossoms, a period of two or three months; in any of these its different states, if gathered, and carefully dried, it will make a most valuable addition to similar plants for decorating apartments in the winter.

It is a native of the Cape, flowers in May and June, and may be increased by cuttings.

### SOLANUM STELLIGERUM.

(Starry Nightshade.)

Class. Pentandria Monogynia.

Nat. Ord. Solaneæ.

Spec. Char. Stem thorny, shrubby. Leaves lanceolate, entire, woolly beneath. Prickles recurved; flowers in axillary umbels. Wood starry.

The stem is much branched, the branches alternate, leafy, round, woolly, beset with scattered, slightly recurved prickles of a tawney hue. Leaves on shortish stalks, alternate, pointed, veiny, very smooth above (except the rib and veins); extremely woolly underneath. Flowers about four or five together, in a simple axillary umbel; their stalks and calyx woolly. Corolla pale purplish blue. Berries small, globular, scarlet. The wool of the whole plant is composed of little elevated entangled stars.

This shrub grows to the height of three, four, or five feet in its native country of New South Wales, forming a dense bush.

### KRAMERIA TRIANDRA.

(Triandrous, or Peruvian Krameria.)

Class. Triandria Monogynia.

Gen. Char. Calyx, 0. Petals, 4. Nectaries, 2; the superior 3-parted, the inferior, 2-leaved. Berry dry, echinated, and containing one seed.

Spec. Char. Leaves oblong, ovate, pointed; stamens three.

The Krameria Triandra is an undershrub, with very long, much branched, spreading roots, of a blackish red colour externally, red internally, and having an intensely styptic, bitter taste. The stem is procumbent, dividing into numerous spreading branches, which when young are white and silky, but afterwards become naked below, and acquire a black colour. The leaves are scattered, and silky on both surfaces. The flowers are terminal, and solitary, consisting of four lake-coloured petals. The berry or drupe is dry, globose, echinated on all sides with stiff reddish hairs.

This species of Krameria, called by us Rhatany, is the spontaneous growth of many provinces in Peru, delighting in a dry, argillaceous, or sandy soil, and growing on the declivities of the mountains, exposed to the intense heat of a vertical sun. It flowers nearly throughout the year, but blossoms most luxuriantly in October and November.

It is gathered in large quantities, from which a beautiful extract is prepared, which as well as the root, is exported to Portugal, for improving the colour, astringency, and richness of red wine.

Rhatany is a very valuable tonic medicine for indigestion.

### SOLANUM DULCAMARA.

(Woody Nightshade, or Bitter-sweet.)

Class. Pentandria Monogynia.

Nat. Ord. Solaneæ.

Spec. Char. Stem flexible, without thorns; upper leaves irregularly hastate; Corymbs drooping.

This well known species of Nightshade has several long, slender, winding stems, dividing into a few erect branches, and rising, when supported, to the height of eight or ten feet. The stalks are covered with a greyish-green bark, on the lower part, but of a purple hue on the upper side, towards the end of the branches. The root is small, creeping, and woody. The leaves are soft, of a dull green colour, and supported on footstalks. The flowers are in very elegant, branched corymbs. They are violet-coloured, with two round pale green, or whitish spots, at the base of each segment. The berries, which ripen in autumn, are oval, scarlet, full of a nauseous juice, and contain several whitish seeds.

A decoction of the twigs of *S. dulcamara*, produces on man the ordinary symptoms of narcotic poisons. The crimson berries which ornament our hedges at the approach of winter, are known to our peasantry by the name of "Poison berries." They have a disagreeable, bitter taste, and are in the highest degree deleterious; numerous well attested cases being on record of children being killed through eating of them.

### CAMPANULA PERSICIFOLIA. Var. Maxima.

(Greatest-flowered, Peach-leaved, Bell-flower.)

Class. Pentandria Monogynia.

Nat. Ord. Campanulaceæ.

Spec. Char. Radical leaves obovate; Cauline lanceolate—linear sub-serrate, sessile, remote.

Those who have been accustomed to see the *C. persicifolia* in its single state, (now but rarely met with in our gardens, the two varieties with double flowers having usurped its place), will perceive in point of general habit, a striking similarity betwixt it and the present plant; the only difference indeed appears to consist in size, and as size alone forms no specific character, we have been induced to regard this magnificent plant as a variety of that species.

By the introduction of the present plant our flower borders gain a most desirable ornament; and the acquisition is the more

valuable, as the plant is very hardy and easy of culture, increasing by its roots, which are somewhat creeping, and may be parted either in Spring or Autumn.

In a moist rich soil, it will acquire the height of three or four feet, and produce during the months of August and September abundance of flowers truly magnificent.

### IRIS CRISTATA.

(Crested Iris.)

Class. Triandria Monogynia.

Nat. Ord. *Irideæ.*

Gen. Char. Corolla, 6-parted, unequal, every other division reflexed, stigma shaped like petals.

Spec. Char. Corolla bearded ; beard tufted ; stem 1-flowered, length of the leaves ; Germen 3-sided.

The tube of the flower in this species is unusually long, tender, and brittle in the extreme ; the flowers are delicate, with little or no scent. It blossoms about the middle of May.

If the *Iris Cristata* be planted in bog earth, in a moist situation (for it will not succeed at all in a dry one) and has the shelter of a hand-glass in severe weather, it will grow readily in the open border. It is increased by dividing its roots.

### VIOLA TRICOLOR. Var. a.

(Heart's Ease.)

Class. Pentandria Monogynia.

Nat. Ord. Violarieæ.

When we consider that in one collection exhibited at the Horticultural Society, there were a hundred and four distinct varieties, it is amusing to turn back to what the flower was a few years ago ; which may be estimated by a reference to any of the works then published. We are told in the dictionaries of the day, that its "petals are obcordate, shorter than the calyx, and whitish, or yellowish white, in its wild state ; but longer than the calyx, and variegated with yellow and purple in the gardens." That "the truly wild plant has sometimes a few purple streaks, and in a somewhat improved state is blue or purplish, with or without yellow and white." That "it is a native of Europe and Japan, flowering from May to September ;" and that "it varied then with more than two colours ; as purple, blue, yellow, and white, improved and enlarged by garden culture." From this state it has been brought to excel almost every description of flower, in the number, distinctness, and beauty of its colours and varieties, and every day brings us new, splendid, and striking additions. It is propagated with ease, by cuttings dibbed in six inches apart, and occasionally watering them.

They require but little culture, they grow best in a rich shady border, and may be parted often, the smaller plants bearing larger flowers than overgrown roots.

### CHIRONIA DECUSSATA.

(Cross-leaved Chironia.)

Class. Pentandria Monogynia.

Nat. Ord. Gentianeæ.

Gen. Char. Calyx, 5-parted, erect ; Corolla equal, with a 5-parted limb of ovate equal segments ; Anthers after bursting spiral ; capsule ovate ; seeds numerous.

Spec. Char. Shrubby, subtomentose ; leaves close together, oblong, obtuse ; calyx globose, 5-parted.

A very ornamental greenhouse shrub, occupying but little space and continuing long in blossom. It is a native of the Cape of Good Hope. The stem is eighteen inches high. Flowers from June to September. They are of a shining crimson.

It is not a long lived plant, and therefore requires to be frequently raised from cuttings. Peat mould with a little loam mixed with it, suits them best ; and young cuttings planted in the same kind of soil, under hand glasses, strike root readily.

### LINUM HYPERICIFOLIUM.

(Hypericum-leaved Linum.)

Class. Pentandria Pentagynia. Nat. Ord. Lineæ.

Spec. Char. Sepals hairy ; acuminate, sessile, alternate ; leaves alternate ; and the branches opposite.

Stem thicker than a crow's quill, from 18 inches to 2 feet high, round, pubescent, leaves inclining to glaucous green, closely scattered so as to appear almost verticillated in some places. Bracteas much narrower than the leaves. Petals of the flower from the bottom of the claw nearly to its top yellow, then for a short space white, beyond the claw, rose-coloured with deeper tinted lines changing to purple at the bottom. The claws within besprinkled with short glands, filaments pale yellow ; pericarpium yellowish green when young, styles 5, pubescent at base.

This beautiful species is a hardy perennial, and may be increased by dividing the roots in autumn, when the rains begin to fall, as well as by seed.

### MESEMBRYANTHEMUM ACINACIFORME.

(Scymitar-shaped Mesembryanthemum.)

Class. Icosandria Di-Pentagynia.

Nat. Ord. Ficoideæ.

Spec. Char. Leaves acinaciform ; edges curled, wavy rough.

A species which very seldom flowers in this country. Stem while young glaucous, nearly as thick as one's little finger, compressed and two-edged ; afterwards much more slender, its cuticle shrinking into 6 angles and changing to a pale brown. Leaves glaucous, from $2\frac{1}{2}$ to 4 inches long, very succulent, the last pair under the peduncle scarcely an inch long. Flowers purple, but more inclining to rose colour than violet, some of the petals entire, others 2 fid at the point. A native of the Cape of Good Hope. It requires to be kept dry, and may be increaesd by cuttings planted in very sandy gravelly soil.

## RECEIPTS FOR MAKING CURRANT WINE.

Several years ago, the Caledonian Horticultural Society awarded prizes for various specimens of Currant Wine. The following are some of the receipts which obtained chief favour. Among the successful competitors were several ladies.

No. I. To every English pint of the juice of fully ripe white currants, were added two English pints of cold water, and one pound of raw sugar.

The fermentation was promoted by gentle agitation every day for eight or ten days. But no article was added to promote fermentation.

When it appeared from the taste, that the liquor had obtained the pure vinous state, without either great sweetness on the one hand or any obvious acidity on the other, which state was acquired in about the space of a month, the further progress of fermentation was checked by the addition of a small quantity of pure ardent spirit. One bottle of good whiskey, free from any peculiar flavour, was added to twenty gallons of the wine.

After this the cask was bunged up and allowed to remain at rest for six months. The pure wine was then racked off from the sediment into another cask, in which it was allowed to remain twelve months before it was bottled.

When sent to the society it was five years old. It was marked *vino pellite curas.*

No. 2. The wine to which the second prize was awarded was marked *on n'est jamais trop vieux apprendre.* The following was the receipt which accompanied it :

One Scotch pint of currant juice ; one Scotch pint and a half of water ; three pounds of sugar ; half lump and half soft sugar : (a Scotch pint is equal to two English quarts).

Mix them together in a tub, then fill your barrels. What is over, keep for filling up, as it works over ; but it is better not to fill up more than twice. When done working, add one Scotch pint of aquavitæ or brandy, to twenty pints of the fermented liquor.

The wine sent is flavoured with a small quantity of clary wine.

5. Campanula persicifolia.

6. Iris cristata.

7. Viola tricolor var. a.

8. Chironia decussata.

9. Mesembryanthemum aetnaeflorum.

10. Linum hyperaefolium.

## GARDENING OPERATIONS FOR MARCH.

### KITCHEN GARDEN.

MANY of the things mentioned as belonging to this head have been mentioned under the preceding month, though most of them might be performed now with better prospect of success, as this is the principal month in the year for sowing and planting full crops of the greater part of kitchen-garden vegetables. We go on, however, to the more particular points now deserving attention.

Early purple and cauliflower brocoli should be sown both about the beginning and towards the latter end of this month, in a bed of rich earth, in an open situation, to raise plants to be fit for the table in the following autumn. Sea cabbage may be sown any time this month in narrow beds of light earth, about four feet wide, for the convenience of weeding. They may either be sown all over the surface of the bed, tolerably thick, when they are to be transplanted, or in drills a foot and a half or so apart, where they are to remain. Those plants are perennial and every year push up thick succulent shoots. They should be covered some time during winter with dry earth to the depth of a few inches, by which the young shoots as they come up in spring are blanched and become fit for use. Sow in an open situation brown and green cole. The plants raised now will be fit for planting out in summer, and may be cut any time for use from autumn to spring. Asparagus seed may be sown in narrow beds of good earth, in an open situation, in the course of the month. The plants will appear above ground in four or five weeks, when they ought to be kept clear of weeds, and watered occasionally during dry weather. The plants raised now will be fit for transplanting next spring into hotbeds, where they are to remain and produce crops, or into plots, to remain for a year or two till they be fit for forcing. This is also a proper season for making plantations for asparagus, for which purpose plants of one or two years of age are commonly used. They succeed best in a deep light soil and exposed situation. A crop of onions may be sown in beds when it is an object to make the most of the ground. It is proper now to examine artichoke plants that were earthed up during winter to protect them from frost; and if their stems appear to push up vigorously, the earth ought to be removed aud levelled. The redundant shoots, if carefully detached from the main roots, may be employed to form new plantations; the earth, therefore, should be so far removed as to allow the hand to be introduced to slip them close to their insertion. Plantations of young artichokes are made towards the end or in the course of next month, as soon indeed as the offsets can be procured. Cuttings or slips of sage, rue, rosemary, hyssop, thyme, savory, and such-like pot-herbs, may be planted any time during the month. They should be put about six inches apart, and to the depth of nearly two-thirds of their length. By next autumn they will be fit for transplanting. Skirrets may be sown in narrow beds in an open situation. This plant is frequently propagated by offsets taken from old roots. If the weather be mild and dry, a few early kidney-beans may be sown towards the end of the month in a well sheltered situation, at the foot of a wall having a south exposure. Cardoons, about the middle or later in the month, may be sown for transplanting. They are biennial, and are cultivated for the sake of the footstalks of their leaves, which are blanched by being earthed up somewhat in the manner of celery. Chives, a small species of onion, should be planted now. They are propagated by parting the tufts into smaller portions and dibbling them in rows or beds. Jerusalem artichokes may be planted much in the same way as potatoes are; they will be fit for the table in October. Of potatoes a full crop may be planted any time towards the end of this month or in the course of the next. The principal varieties cultivated are the early dwarf, champion, large round white, oblong red and white kidney, common kidney, small white kidney, round red, large round dark red, &c. New plantations of mint may be formed. This plant is propagated by parting the roots, or by cutting off the young stalks; the former is practised this month, the latter in next and following. The kinds commonly cultivated are spearmint, peppermint, orangemint, &c. The leaves and flowers of Indian cresses are frequently used in salads, and their seeds for pickling. The seeds may be sown about the beginning of the month, at the distance of two or three inches from each other, in drills, about an inch deep. If they are not alongside of a hedge or other support, they may have sticks placed near them as peas have. Seeds of basil, love apple, and capsicum may be sown any time during the month. They are tender annuals, and must be sown in a hot-bed to be afterwards planted out in the open ground in May. Sow cucumbers and melons to be planted out under hand or bell-glasses. Some cucumber and melon seed may be sown towards the end of the month in any of the beds already employed; or one may be formed on purpose to raise plants to be reared under glasses. Those sown now will be fit for ridging out in the beginning of May.

### FRUIT GARDEN.

The fruit trees mentioned that might be pruned last month, may have it done this month, but it should be as near as possible its early part, lest they advance too far for this operation to be safely done. But this is the best season for so treating fig-trees, on account of the late period at which they begin to push. Fruit trees may still be planted, but the earlier the better. The duration of the planting season depends more on the state of the weather than the time of the year. Apricot, nectarine, and peach trees, when in flower, should be protected during frost with large garden mats fixed to the top of the walls by hooks, and fastened at the bottom to prevent them flapping, so as to damage the blossoms; but they must be removed during the mildest part of the day, unless when the weather is very severe, and without sunshine. Fruit trees on hot walls, in peach, cherry, and vine houses must receive air and water regularly, and have the fires put on every evening and cold morning. Dress strawberry beds, if not done last month.

### FLOWER GARDEN AND PLEASURE GROUND.

Early annuals that may have been sown last month will be fit for planting out into small pots or a hot-bed prepared for the purpose. This hot-bed should be raised to the height of two feet, and when the violent heat has subsided, covered over to the depth of six inches with rich dry earth. If properly taken care of, they will be fit for final transplantation in May or June. Tender annuals, if not sown last month, may be any time in this, and half-hardy kinds should now be sown, such as Indian pink, French and African marigold, tree and purple amaranthus, &c. Cuttings of double chysanthemums, which were planted last autumn in pots or boxes, should now be put into pots or flower-borders, if mild weather prevail. Auricula plants in pots should be protected from rain and frost, and should still be kept covered with hooped arches, over which mats may occasionally be thrown. If the pots received no fresh earth last month, let them have some now. Let the hoops continue also over the beds of tulips, hyacinths, and ranunculus. Towards the end of the month, seeds of biennial and perennial flowers may be sown, such as carnations, pinks, wallflowers, &c. These sorts of plants may also be transplanted at this season. Trees and shrubs, both evergreens and deciduous, may still be planted, but early in the month.

### NURSERY.

Fruit trees, elms, &c. may be engrafted; and the shoots of trees engrafted last year should be so shortened about the time their buds begin to swell as to leave four or five buds, which will push out branches to form a head. The shoots of last year's growth of trees, budded the preceding summer, should likewise be shortened, and the heads of trees budded last summer should be cut off about four inches above the bud, which will cause it to push out vigorously. The part of the stock which is left will serve as a support, to which the young branch

may be fixed in the course of the summer, to prevent it from being blown out by the wind. Seeds of hardy trees and shrubs may be sown any time this month, in beds three or four feet wide, which should be well dug and thoroughly pulverized. The seed may be sown regularly over the surface of the bed or in drills, and covered in proportion to their size—the acorns and other large seeds to the depth of about an inch and a half or two inches, and the smaller ones from half an inch to an inch. Some of the more delicate shrubs may be sown in pots or boxes. Most kinds of trees and shrubs may be propagated by cuttings this month, particularly vines.

Vine cuttings must be shoots of last year's growth, about ten or twelve inches long, each having three buds. If cut from the vines during winter, before the sap begins to rise, and preserved in dry earth, they will succeed the better. They may be planted in rows about a foot and half asunder, and at the distance of eight or ten inches from each other in rows, and so deep as to leave only their uppermost bud above ground. They should afterwards be occasionally watered and kept clear of weeds. Though cuttings of vines may be raised in the open air, much better plants may be obtained by striking them in a hot-bed or tan-pit in a hot-house. At pruning season select some well-ripened shoots, cut them into pieces of a convenient length, and insert them a little way into pots filled with dry earth, where they may remain till wanted for planting; protect in severe, but in mild weather expose them to the free air. About the beginning of this month, if there is no room in the hot-beds already made, prepare one on purpose. Fill a number of pots, about four inches deep, corresponding to the cuttings you mean to plant, with rich light earth. Take the cuttings preserved during winter, selecting those with the soundest and fullest buds; cut the branch about a quarter of an inch above, and about three inches below the bud, with a sharp knife, so as to make a smooth cut, and insert each close by the side of the pot, so deep that the bud may be covered about a quarter of an inch. Plants raised in this manner seem as if reared from seed. As soon as the cuttings are planted, plunge the pots into the earth of the hot-beds, give them a gentle watering and put on the glasses. A moderate bottom heat is all that is necessary. Admit air freely during the day, and night in mild weather, but in cold weather cover the beds with mats during night. The cuttings should likewise be shaded when the sun is strong. When the plants are about six inches high they will require to be shifted into larger pots, which must be done cautiously. Support the shoots when they get higher, and pinch off the tendrils and lateral shoots as they appear. They will be fit for planting out in the end of June or beginning of July.

### GREEN-HOUSE AND HOT-HOUSE.

Unless during wet or frosty weather, the plants should receive air freely, and more frequent and plentiful waterings than in the two former months. Dead branches or decayed leaves must be removed, and any of the larger leaved plants that appear foul should be cleaned with a wet sponge. Those requiring shifting or pruning must be attended to. Sow seeds and plant cuttings of green-house plants, for which a hot-bed or tan-pit is necessary. Pine-apple plants require a good deal of warmth, particularly in the tan-pit; as their fruit will now be considerably advanced, they must be kept in a vigorous state of growth, to secure large fruit. If the heat of the tan-bed be not great, at least one-third of new should be added. After the tan has been procured, it should be laid up in a heap, in some shade adjacent to the hot-house, till it begin to ferment. Take then the plants from the tan-bed, and a quantity of the decayed tan from its surface and side, to make room for the new, which must be thoroughly mixed with the old. This operation ought to be completed in one day. Pine-apples and other plants in the hot-house should be regularly watered, and have fresh air admitted in bright calm days, from about two hours before noon till two or three after noon.

## ARMAGH.

In our notice of Antrim we observed that the northern counties of Ireland presented the same general features as respects their rural economy. The cultivation of flax, the manufacture of its produce, and a small size of farms characterizing them. Armagh, however, presents these features in such an advantageous manner as to deserve a distinct consideration, even although it should lead us to a repetition of what was said concerning Antrim; not only because the subject in common between them is worthy of particular observation, but because it is here exhibited in a still more favourable style. We also mean to seize upon this opportunity to offer a few remarks on what has lately been published by a very competent authority, regarding the landed property and small farms in Ireland, giving copious extracts.

The inland county of Armagh contains a superfices of nearly 458 square miles, and according to the census taken in 1821, its population amounted to 197,427 souls, which is at the rate of one individual to every acre and a half, the whole estimated acres being 293,919. The nature of the soil and the general character of the land are well adapted for agricultural purposes. There are large tracts, particularly in the neighbourhood of the city of Armagh, and throughout the northern parts, of rich productive soil, where wheat might be cultivated profitably, and where indeed great advances have been made in various branches of husbandry. The surface of the greater portion of the county is diversified with gentle and pleasing hills of various altitudes and picturesque forms. In the southern and western parts, however, where the Fews mountains are situated, ruggedness and barrenness prevail. Armagh is well watered by numerous streams, and has Lough Neagh on its northern border, which is computed to cover 94,274 acres. The other lakes which are within the county are small.

Farming is neither in a very advanced nor inferior condition. The farms, as before-mentioned, are in general very small; but the farmers, or rather cultivators of these small patches, are in their circumstances comparatively comfortable. The great feature here is the union of the linen manufacture with the culture of a few acres of land, and this circumstance gives a peculiar character to its agriculture and to its people. Scope is thus afforded for an immense population; and as the manufacture spoken of can be conveniently carried on in the country, the people are chiefly rustics; so that Armagh cannot boast of above four towns of more than 1000 inhabitants each. Farm manure is much used, and lime still more. This is chiefly burned with turf. Fifty barrels are allowed to the Irish acre. There are few who do not keep at least one cow, or a few sheep; none but the poorest cottager is without a pig. The men devote to the loom the hours not required for the management of their small farms; the women spin and reel the yarn amidst their domestic duties. And so well does this mixture of occupations succeed that the farmers are able to do more than supply the vast population of the county with vegetable, though not with animal food. The usual diet of the people is oatmeal variously manufactured into dishes, potatoes and milk, sometimes varied by salt herrings. The better sort of farmers have animal food and broths regularly; bacon and poultry are abundant. They manufacture much of their own daily apparel, and altogether as a community present the appearance of a comfortable peasantry, rarely to be equalled in any small portion of the island, or surpassed in the United kingdom. The women are generally handsome, the men well proportioned and healthy. On holidays and gay seasons they exhibit dress and manners indicative of superior civilization. Their dwellings are cleanly. They are remarkable for lively gratitude, and a quick sense of injury or insult.

We have of course been speaking only in a general way. It is not to be thought, therefore, that there are not large farms in Armagh, and enlightened farmers. These are on the increase,

and green crops are every year more attended to; but it is the combination of agricultural occupations with domestic manufactures that characterises the county. In speaking of its products we must not forget to tell that apples are grown in such quantities as to entitle Armagh to the distinctive appellation of being the orchard of Ireland.

But though such be the comparatively comfortable condition of Armagh, we are anxious to append a few extracts from Mr. Blacker's late essays, the one "Addressed to the Royal Dublin Society on the Management of Landed Property in Ireland," the other "On the Improvement to be made in the Cultivation of Small Farms, by the Introduction of Green Crops and House-feeding the Stock thereon," as applicable not merely to Armagh but to the whole of the island.

The inferiority of Irish agriculture is proverbial and lamentable, especially when contrasted with the capabilities of the soil. Many causes combine to keep back every thing like efficient improvement in this important department of national resources. The general ignorance or absence of the proprietors, and the unfitness of their agents to do more than look after the rents, joined to the subletting system, are more than enough to destroy or suppress every thing like a general advance in agricultural knowledge and practice. Mr. Blacker proves himself, however, to be an honourable exception to the general indifferenee or ignorance, at least, of agents. In the preface to one of his essays our agent tells us:—

"For several years I had been turning my attention to the improvement of the tenantry on the estates alluded to (those of the Earl of Gosford and Colonel Close), and had made several unsuccessful attempts to introduce a better system of agriculture, by circulating the different works published on that subject, and offering premiums for (to) those who would adopt the improvements recommended; but I had the mortification to find there were no claimants for the prizes proposed, and that every attempt I made was a complete failure. At length it occurred to me, that by writing a short address to the tenants, their attention might be drawn to the effects of the present system, and by following it up with the appointment of an agriculturist for the special purpose of instructing them; and, morever, allow him to grant a loan of lime to such as followed his instructions, for the purpose of replacing the manure which he might require for the cultivation of green crops, and adding my own personal influence, I might perhaps have better success."

By this loan of lime, which was to be paid for in money, the circulation of Manuals of Agriculture, and the promotion of the green crop sytsem among small farmers, Mr. Blacker, encouraged by his judicious employers, accomplished great things in the course of a few years.

"There were but two tenants on the estate of the former (Lord Gosford) and none on (that of) the latter, who were able to enter into the competition. The second year there were about fifty competitors; in the third there were not less than 300 or 400, who fed their cattle entirely, or for the most part, in the house; and this year (1834), from the great quantity of clover-seed sown last spring, I think there will be scarcely a tenant on either estate who will not feed his stock upon that plan.'"

Green crops came thus to be cultivated to the protection of the land from the destructive succession of corn crops. The advance on lime enabled the poor labourers of the soil to save their dunghills to the culture of turnips, &c. The style and doctrines of our agent's simple addresses may be judged of from the following specimen on the use of lime.

"It is therefore of the utmost importance, that when you first begin to *lime*, you should raise your potatoes upon it, and make use of the house manure which this leaves at your disposal, to raise turnips or mangel-wurzel for house-feeding, and increase your stock of cattle to the utmost which this plan will enable you to keep; setting it down for certain, that you ought to have at least one cow for every three acres of arable land, as being the *smallest* stock which will enable you to keep your land in heart, when the resource of lime can no longer be looked to. If this is not kept in view from the very outset, you will find that you cannot manure the one-fourth of your farm every year, and you will therefore be thrown out of the rotation—the land will be exhausted and left to rest as formerly, and as it gets poor you will get poor yourselves; and having no longer the relief of lime to fall back upon, your case will become worse than what it is at present; for *now* by lending you lime, I have no doubt of making you comfortable and independent, if you are only industrious and willing to follow the instructions given you; but *then* this resource is lost to you, and I do not see what other can be available to you."

Will the Irish landlords, after this, continue so blind to their own *immediate* interests as not to afford the help, so indispensable and efficient, as that of giving lime and supporting an agriculturist to instruct the poor ignorant farmers? Are they afraid of the expenses of such provisions?

"But what, it will be asked, may be the expense of attempting to follow a plan which, it must be admitted, seems at least to have much to recommend it? To this it may be answered, the expense is trifling indeed, compared with the objects likely to be obtained. Those agriculturists I have hitherto brought, and who have all turned out to be very deserving men, have been engaged at a salary of 25*l.* a-year, with a cabin and two acres of land, rent free; or in lieu thereof, a lodging, with the Scotch allowance of six and a half bolls of meal, and what milk they might require, all which does not amount to more than 10*l.* a-year in addition to their fixed salary. Nothing can be accomplished on a large scale, without having a respectable man in this situation; for the ignorance of the generality of small farmers is such, that they will put out their lime on land not drained, whereby the advantage of it will be lost almost entirely; and they will sow the clover-seed on exhausted land, where it will not grow, and will therefore become a total loss; also they have, generally speaking, little idea of what clean land is, nor how to set about making it so, and their manure therefore goes to nourish weeds as much, or more perhaps, than the crop sown; for all which reasons, I look upon this appointment as indispensable, where any extensive success is aimed at.

"The next expense to be considered is the advance of lime. In this respect my practice has been to lend it to almost every one who applied, let their circumstances be what they might, making only the stipulation that the instructions given should be strictly followed. I adopted this line in order to shew the people that my wish was to benefit every one, and that I was not actuated by the selfish motives of merely aiding the very poor class, in order to lessen my own trouble in getting in the rents. The liberality of my employers enabled me to act on this extended plan, which of course occasioned the greater outlay. But when the landlord is restricted in means, of course the loan will be confined to those who stand most in need of assistance. The advance required depends so much upon the size of the farms, the density of the population, and other circumstances, that it is hard to fix upon any sum per thousand acres, as sufficient for this branch of the expenditure. The more people there are, the more industry is capable of being brought into activity, and the more capital is of course required; likewise the greater the poverty the greater assistance will be necessary; so that the advance required must evidently vary in different estates, though they may consist of the same number of acres.

"But I would hazard the opinion, that in most parts of the north of Ireland, 50*l.* per thousand acres would be found sufficient to supply the requisite loan of lime, and provide turnip and rape seed, which I have as yet given gratis. Every poor tenantry will be found so much in debt for their seed-oats, seed-potatoes, and perhaps even for subsistence, and subjected thereby to such usurious charges, that I have found it necessary to give in the first instance three years' credit, in order to get them out of the power of their creditors. The repayment of the sum so

lent now forms a fund for carrying on the system, and I do not anticipate being obliged to make further demands upon my employers; but when this credit, from the pecuniary wants of the landlords, cannot be given, I think the repayment might be insisted upon from the produce of the first grain crop after the loan. My lending of clover-seed was an afterthought, but is a matter of pecuniary importance, and the cost of so large a supply came to such a sum, that I was obliged to limit the credit upon it to six months, which brought the repayment to the time of harvest, and as I obtained the same credit from the London seedsman that I gave to the tenantry, there was no advance of money in that particular, and the advantage has been the greatest that could be imagined, in doing away immediately with the practice of sowing successive grain-crops as already alluded to.

"To sum up the whole then, it would appear, that to make the conviction produced by the perusal of the pamplet *operative*, all that would be necessary on the part of the *landlord*, would be, an annual outlay of about 35*l.* to the agriculturist which would afford the necessary instruction, and an advance of about 50*l.* a-year per 1000 acres, for three years at most, in lime, to replace the manure taken from the potato crop. This is the entire expense, except the trifling costs of the pamphlets; and when to this the tenant has added his industry, and the agent his influence, the system is complete. I do not in the above calculation, include the trifling sum which the landlord may feel disposed to give in premiums for the encouragement of those who most distinguish themselves by their exertions, nor any occasional assistance he may feel disposed to give in lending a pound or two for a few months to assist a tenant in buying an additional cow, when his clover was superabundant; these being optional matters, and not absolutely necessary."

Few out of Ireland are aware of the burdens the poor Irish farmers have to labour under. The usurious prices paid for seeds, sounds strangely in English ears. Twenty-five per cent. is frequently given for seed-oats in spring, to be paid in autumn. Let us now observe what is recorded by our agent in behalf of the farmers, who are represented as extremely industrious and grateful. Our eyes filled with what came from mingled emotions of compassion and delight, on reading the following passage:—

"'I have gone myself to see a poor man, the tenant of less than four acres of land, whose name and residence I can give if required), who was threatened with an ejectment, being, as well as I can recollect, two years and a half in arrear. I found him sitting with his feet in the ashes of a half extinguished fire, his wife and five children nearly naked; want and misery surrounding him on every side—his house and farm neglected—the fear of expulsion preying upon his mind and spirits had destroyed his health, and there he was awaiting the beggary and starvation impending over himself and his family, in a kind of listless insensibility. In short, the whole scene was that of actual despair, and the man was evidently in such a state, that he was incapable of any exertion whatever. Having satisfied myself that he was not wilfully slothful, I told him, he should not be turned out, if he would take heart and exert himself, and that he should be assisted with lime, if he would follow the instructions given him by the agriculturist. As I explained to him the plan I had in view for his benefit, it was easy to see the feelings by which he was agitated. With tears in his eyes, he promised to do every thing I required, and I left him, to send the agriculturist to point out what was first to be set about. He faithfully fulfilled his engagement, and did every thing as he was required, and, when his turnips were ripe, I lent him, out of the sum placed at my disposal for that purpose, some money to buy a cow; the family having previously lived on potatoes and salt, and for even this they were in debt. This was his commencement, and, in the short space of about eighteen months afterwards, I found his house clean and comfortable looking, and the place about it equally so; his 3½ acres all in a profitable state; in fact, I could not put my foot upon a spot that was not either in crop, or in preparation for one, and he himself with his health restored, actively employed in wheeling up earth in a wheelbarrow, from the bottom to the top of a hill in his land, where the soil was shallow, in which his daughter, a fine stout little girl, was helping him, pulling by a rope in front; and the whole was a picture of activity and successful exertion.

"These two years have not been favourable for the farmer, but he has contrived to pay up all his arrears, and although his diet, and that of his family, is of necessity, at present, almost exclusively confined to potatoes and milk, they are all healthy, happy, and contented. Another year will, I expect, enable him to pay off all his debts, and then, between the produce of his loom, and the increased produce of his farm, he will be able to command almost all the comforts which people in his line of life are most ambitious of. His rent is 4*l.* 8*s.* 3*d.*, which the butter from his cow will generally pay, leaving him his pig, his crop, and the produce of his loom to himself. And, yet, this is the same man, who, upon the same piece of land, and subject to the same rent, was so lately upon the verge of beggary and starvation."

Here is a "milking mother," and incalculable blessings follow her. On Lord Gosford's Cavan estate, consisting of 8000 acres, and moderately set, the arrears had been on the increase. But in the second year of our agent's exertions, the rents of that year were paid up, and a part of the arrears. Many of the tenants have subsequently paid all they owed. How infinitely preferable are such means of supplying an absentee's demands, to the general clearance that is frequently enforced, causing the outcast to become beggars or emigrants! There are some bad men, (we may designate them as robbers) who whenever an industrious farmer improves his land, raises the rent upon him. Such are said to be rare in Ireland. Some landlords are of quite a contrary stamp.

"I shall never forget a scene which took place upon one occasion when the extent of the reduction to be made was under consideration; and his Lordship went with me himself personally to examine into the state of things, the surveyor accompanying us, upon a farm held at will, near Baleek, which has been greatly improved, and was not in any arrear whatever. The owner came up to us under evident alarm and agitation, fully impressed with the belief that the consultation he saw going on could be for no other purpose than to decide upon what advance he should be charged, and began, in the most desponding manner, to represent all he had done to improve the ground, and pointing out the adjoining fields remaining in the same unreclaimed state from which he had rescued his portion, concluding by throwing himself entirely upon his Lordship's generosity, and was about to retire, when his Lordship called him, and said, he had entirely mistaken the object of his visit, which was to *reduce* his rent, and not to *raise* it, and that the reduction should be allowed for the two years preceding, for which he gave orders on the spot; adding, that he saw the improvements he had made, which he hoped he would live long to enjoy; and cordially shaking him by the hand, proceeded to another farm, leaving him overpowered with feelings of gratitude and surprise, which he was wholly unable to express, and the *bystanders* at a loss to decide whether the feelings of the landlord or the tenant were most to envied."

We hope that there will be few preprietors so unreasonable on the other hand as to expect that all at once, the advantages to be derived from our agent's measures can be realized.

"—— it is not in one year or in two that this change can be made. The first year the lime produces a crop of potatoes, which is required for the consumption of the family, and by keeping them from the necessity of buying their food, enables them, by their industry, to pay off some of their debts, or add something to their comforts. The second year the grain crop goes to make up the deficiency arising in their means of paying rent, from clover being sown in place of a second crop of oats. The third year the same portion is in clover, which will enable them to rear additional stock; and it is not until the fourth

year that the crop of grain, after the clover, really brings the farm into a productive state: and if the plan be persisted in for four years, it then certainly will have brought it into complete order; for, by the four-course rotation I have stated, the entire farm will have been drained and manured, at the rate of one-fourth part every year, it being the business of the agriculturist to see the drainage of the land properly effected, *before he gives the order for the lime to manure it with.* It is evident that the circumstances of the parties must be improving from year to year, and if urgently pressed for the amount of the lime, there is no doubt the produce obtained from it ought to have supplied them with the means of paying the demand; and if they are not to be depended upon for making a good use of the funds coming into their hands, it might perhaps be better to insist on an early repayment; but as they are in general in want of almost every thing, if they are sober and industrious, I think they will require all they can save to supply them with such necessaries as they may stand in need of, and to enable them to increase their stock, which it is necessary to attend to immediately, because, according as the worn-out land, which has been left to rest, is brought by the force of manure into a productive state, and that clover and house-feeding is substituted for miserable pasture, the land previously allowed for the support of one cow will, with ease, support three or four, and the great difficulty will be, to make the increase of the stock keep pace with the increase of the food. In the experiment I have been making, I have not yet arrived at the fourth year; and it remains to be seen whether I shall be repaid without trouble. I am sanguine that the amount will be paid as I have said; however, others doubt it, and the great fall at present in farm produce will undoubtedly render the collection more difficult; but if a part, or even the whole, was lost, I have no hesitation in saying that the money is well laid out, and that any extensive landlord will find his account in introducing upon his estate a regular system of cultivation, even by the total loss of all the advances that would be required."

The moderation, the wisdom, the humanity of these views are gratifying in the highest degree, even to the mere reader of the above passages. The writer's calculations on the advantages consequent on a system of house feeding will instruct many out of Irelaud.

"During the summer months, your cow, which is only in the house at milking-time, (and perhaps not even then, for the practice is sometimes to milk her in the field,) can afford little or no addition to the manure heap, being upon the grass both day and night; and even in winter and spring, whilst there is any open weather, they are [she is] always to be seen ranging over the field in search of food, so that I think you cannot but admit that upon a calculation for the entire year round, the animal is not in the house more than eight hours out of the twenty-four, and it is only the manure made during this period which can be reckoned upon; therefore, upon this supposition (which I think sufficiently correct to show the truth of my argument), if there is any truth in arithmetic, *one* cow fed as I calculate on in the house for the entire *twenty-four* hours, will yield as much manure as *three* that are kept in the house for *eight* hours only, the quality of the food being supposed the same in both cases; and this would manifestly prove my assertion, namely, that *one* cow fed *within* would give as much manure as *three* fed *without*, and, therefore, when *three* can be kept in the *one* way, as I have already shown, for *one* kept in the *other*, it *is as clear* as three times three make nine, that the result of the calculation will be just as I have stated, namely, that the farmer will obtain by the change of system nine times as much manure in the one case as he would have had in the other.

"Now, if after all that has been said (which seems to *me* at least quite convincing), any of you should be so astonished at the quantity of the manure thus proved to be gained as still to have some misgivings on the subject, and be inclined to think that matters would not turn out so favourably in *practice* as I have shown in *theory*, I would wish any such person to consider one very material point which I have not yet touched upon, for, in the foregoing statement, the argument is founded entirely on the *time* the animals are kept within, viz. it is stated, that *one* cow kept *within* for *twenty-four* hours will give as much manure as *three* cows which are only kept in for *eight* hours, the food being assumed to be the same in both cases; but it is quite evident that if the cow kept *within* should be fed with turnips, and *bedded with the straw* which the others are *fed* upon, leaving them *little or no bedding whatever*, that the calculation must turn decidedly in favour of the animal which is well fed and bedded, both as regards the quantity and quality of the manure; so that it appears the estimate I have made is decidedly under the mark.

"I need only ask you to think *what you might do* in your farms if you had but six, five, or even four times as much manure as you now have? or rather let me ask, *what is it you might not do* if you had such a supply? Surely you would not in such case let the land lie waste, as you now do, to recover itself, when you had the means of instant recovery in your own hands; nor would you rely upon one-half of your farm to do the work of the whole, when you had the means within yourself of making the other half equally productive."

Mr. Blacker's agricultural maxims are sound. He maintains for instance that the ground must be thoroughly drained—weeds must be destroyed—all cattle must be fed in the house or straw-yard upon good food—and that two successive crops of the same kind are not to be taken.

"I am fully sensible, however, that a system of over-cropping with grain will extract *every kind* of nourishment from the soil, and leave it so *that it will not even yield grass.* This is the case with land which is left to *rest*, as it is called, by those who take three or four grain crops in succession, and the phrase is well applied, for the land is really not fit to *do any thing.* The error of this class of persons is, that they turn the land to grass at the *end* in place of the *beginning* of their course. Had *grass-seed* been sown with the *first crop of grain*, there would have been a good crop of hay, and good after-grass, and the second crop of grain would have been as good as the first; and this is what ought to have been done by those whose land is not suited to clover, or who from poverty are not able to buy clover-seed; and even where *two* grain crops have been taken, it would be better to sow it with rye-grass, which will yield a crop on very poor land, rather than to leave the ground to be possessed by weeds and such herbage as may naturally rise. The fact is, the last exhausting crop should only be put in upon that portion of the farm which is intended for potatoes, and other green crops, the *succeeding year*, which crops then give the manure to restore it to a productlve state; and by this means there is no land at all lost by what is called *resting* it."

Many other sound agricultural principles are addressed in plain and forcible reasoning to the farmers whom he is so anxious to benefit. On the comparative value of turnips and mangel wurzel as contrasted with potatoes we have the following observations.

"Farmers in this country are apt to judge erroneously in regard to the value of such crops of turnips, and mangel wurzel, and other food for cattle, upon this principle that they are not saleable in the market, and they give undue preference to potatoes, on account of the money which they can almost in every season command for them. I am far from wishing to detract from the value of potatoes, and the great advantage which arises from their being adapted to the food of both man and beast; but this very circumstance generally occasions their being *sold*, and thus the farm is robbed of the manure, and the future produce curtailed, for the temporary object of raising, perhaps a trifling sum of money, though the farmer might, in the end, have even made more by *fattening* stock with them (in which respect many prefer them to any other crop) and have had, in this way the manure besides. But if a farmer has plenty of turnips and mangel wurzel, he is not tempted to misapply them, and they are therefore turned to the purpose for which they were intended; and if he has more than is re-

quired for that purpose—he buys cattle lean and sells them fat —or he purchases them in good condition in November, when beef is cheap, and holds them over for the market in spring, when it is dear—or he buys springers in March or April, at a low price, when fodder is scarce, and sells them in May, when they are near their calving, and grass is plenty.

"In all cases he is sure of good profit in money, besides what he makes by manure, which is always most valuable; and both these crops have the advantage of being used raw, whereas potatoes ought, when given to cattle, to be half boiled, which consumes a great quantity of fuel, if used on any great scale. It is a disputed point whether turnips or potatoes are the most beneficial crop; and great difference of opinion exists among persons holding large clay land farms, where carting off the turnips poaches the ground; and also among those who make a trade of fattening cattle upon a large scale who have, in several instances, preferred the latter. But whatever idea the large farmer or the cattle-feeder may entertain, it appears to me there can be but one idea upon the superiority of the turnip crop as regards the small farmer. In the first place, the saving of fuel, to which I have already alluded, is a most material recommendation. Likewise the late period of the year at which they can be sowed, which admits of their succeeding rape, winter vetches rye-grass, annual clover, or early cabbage. The Malta turnip may be sown at any time in July, with the prospect of a full crop. Thus it is clear that three crops may be obtained in two years, turnips being one; besides this it is to be considered that the principal use of the turnip crop to the small farmer, is the support of his regular stock, and the supply of milk and manure. Now a stone of turnips will yield as much milk and manure as a stone of potatoes; and the same land will yield five or six stones of the former at least for one of the latter. Again, when they are applied to fattening, and compared with potatoes sold in the market (which is the usual mode of disposing of them by small farmers), it must not be forgotten that the expense and loss of time in driving a fat cow to a fair, is nothing compared with the labour of attending the market with a horse and cart day after day to sell a quantity of potatoes, when both the farmer and his horse might be most advantageously employed at home in the business of the farm; and that in the former case he gets his money in the lump, whereas the potato-seller receives payment in small sums, which perhaps may be frittered away before it accumulates to any amount. It should also not be overlooked, that even if only half the potatoes were planted which the family might require in order to make room for such crops as would produce food for one or more cows, the value of the milk which would be thus obtained would buy more than twice the quantity of potatoes which the ground taken would have produced. And where there was little land, it might be very profitable farming to plant only early potatoes where there was a good market at hand to sell the whole off in the end of July, and sow the land with rape and Malta turnips for winter and spring use. The value of an early crop of potatoes is very often superior to a late one; and the owner would have the money to lay in his supply in November, and would have besides all the winter and spring feeding, and the milk and manure which the after crop would yield. A judicious farmer should not consider himself bound to raise the potatoes he will consume on his own farm. His object ought to be to manage his land in such a way as to produce him most money, which will always supply him with what he may want."

We are sure that our readers will derive delight and perhaps instruction from the extracts which we have made from Mr. Blacker's essays. Nor can we doubt that his exertions will become of extensive service to the interests of the proprietors and farmers of Ireland. It is encouraging in a high degree to find philanthropy in the practical shape here exhibited; being rationally enforced and experimentally approved. It appears that there is an *Irish Agent's Club* in contemplation. If each man of this class be like the one whose exertions we have been contemplaing, what incalculable and speedy blessings would be showered on Ireland through the landed interest. Surely such a *Club* if properly constituted and supported, will put out of the way those ignorant, indifferent, and inhuman subordinates, that have so long been one of the banes of poor old Ireland. We might in such a wished-for conjuncture confidently anticipate, that the small farmers, would become happy and enlightened cottagers on the most improved allotment system; and that even in the best parts of Armagh, excellent farmers and manufacturers might consistently be united in one individual to the manifest improvement in their own condition, and the moral as well as pecuniary wealth of the island and of the British empire.

## ON INCREASING MANURE.

It is well known that manures are the chief means for enriching soils, and increasing the luxuriance of crops. Gardeners in particular, are dependent upon the assistance of such, for their success generally. Agriculturists sometimes dread having their land in too high a condition for particular crops, but gardeners who look not so much to the ripening of seeds as the abundance of flowers, stems and roots, never dread a full application of manure in some particular form or another. Indeed their general complaint is a want of this indispensable aid, or that the supply is of only one kind of it, viz. the produce of the stable yard. For although for hot-beds and other purposes of forcing, stable dung be essential, yet in its original state it is for other purposes injurious. To become generally serviceable it must be altered by fermentation or blended with substances of a heavier nature.

The following hints, which must fall in with the practice of many, may yet afford useful suggestions to others, respecting not only the increasing the quantity of manure, but multiplying its kinds.

It is usual to increase manure by collecting the urine of animals, mixing soils of opposite qualities, &c., which need not here be enumerated. We confine ourselves strictly to the stable and garden means of increase and variety. During the summer and autumn, then, let all the offals in the garden, such as weeds, leaves of strawberries, short grass, peas and asparagus haulm, with the foliage of trees, shrubs, as they are shed, be carefully collected into a heap; let them be turned over during winter, that they may be sufficiently rotted to mix with the dung against the end of the ensuing summer. Let the prunings of gooseberry and currant bushes, loppings, roots of cabbages, &c., be burnt twice in the year, viz. in spring and autumn; but previously pare up all the coarse grasses around the garden with a portion of the soil adhering thereto; and having had these sufficiently dried, let them be burnt also; the burning requires attention. The fire should be kindled at a convenient distance from the heaps, and that which burns most freely first applied, until the fire has gained such a power as to burn heavier matter. Then let the light and heavy materials be added in such proportions as to keep the fire alive, but not to consume the materials to ashes. When in this half consumed state, cover the whole with mould to keep the fire within; but as soon as the crust can with safety be broke into, let it be mixed up with the rotten vegetables, and stable dung, in such proportions as is likely to insure a moderate fermentation, which will in general, be completed in three or four weeks, when it should be instantly applied to the ground. In autumn when the weather and ground are dry, it is best to use it; for thus the ground has to be dug a second time before cropping, insuring a better blending of the manure with the soil, and thereby becoming more fit for small seeds.

Probably no manure can be better adapted to the general purposes of the garden than the above. The effect which fire has upon any soil, even clay, is only known by those who have experienced its results! and it is well known, that burnt soil is

1. Protea mania.

2. Harrachia speciosa.

7. Convolvulus Jalapa .

8. Bignonia undulata .

9. Anguloa Superba .

10. Convolvulus tricolor.

more conducive to health and fruitfulness of trees, than any application of pure dung, which for a few years may cause them to produce spongy luxuriant shoots, and become subject to blights, or other diseases, that hardly can ever be suppressed, or brought back to their firmness of texture, and form of bud, which are so desirable in fruit trees.

Speaking of the benefit which fire confers, it is prudent whenever a garden or orchard is to be planted, if the ground be under grass, to have it pared, burned and fallowed, previous to trenching, by which means a fund of excellent manure is obtained with the soil, whereas to travel down a surface with its grass beyond the action of the weather, will increase the damp arising from a wet bottom, by forming a stratum similar to that of peat moss, whilst it is throwing away immediate riches.

It is proper to add, that although such importance be attached to burnt vegetables and soils, the same is not to be attributed to coal ashes in their simple state, which often have the most pernicious influence in garden ground. What hath here been said however, is sufficient to show what economy and ingenuity may accomplish in commanding wealth to the support of a garden.

## DESCRIPTION OF THE PLATES.

### HARRACHIA SPECIOSA.

SHOWY HARRACHIA.

Didynamia Angiospernia.—LINN.

Acanthaceæ.—JUSS.

STEM round, jointed, finely pubescent. Branches opposite. Petioles jointed at the base. Flowers in terminal spikes. Bracteas ending in a sharp bristle, though the leaves are obtuse. Corolla of a dull orange colour: tube very slender, dilated at the base, where it is smooth; from thence pubescent, especially on the inside below the anthers, and somewhat angular; middle segment of the limb narrowest. Anthers unilocular, curiously fringed. Pericarpium swelled at the base into a round nectary.

This shrub is a native of the East Indies, where it grows to a pretty large size, flowering all the year round. With us it is a stove plant, and when it has several branches, and the spikes terminating and completely in bloom, it is certainly very ornamental. It thrives well in rich light soil, or in a mixture of loam and peat. Cuttings strike very readily in sand under a hand-glass.

### DODECATHEON MEADIA.

MEAD'S AMERICAN COWSLIP.

Pentandria Monogynia.—LINN.

Primulaceæ.—JUSS.

Root perennial, yellow, from which come out in the spring several long smooth leaves, near six inches long, and two and a half broad, at first standing out erect, but afterwards spreading on the ground, especially if it be much exposed to the sun; from among these leaves arise two, three, or four flower-stalks, in proportion to the strength of the roots, which rise eight or nine inches high; they are smooth, naked, and terminated by an umbel of flowers, which are purple, inclining to a peach-blossom colour. Each flower has a long slender peduncle, which is recurved, so that the flowers hang down. The capsule is of the substance of paper, rufescent. Receptacle columnar, pedicelled, round, acuminate, with excavations on it. Seeds ovate-rounded, turgidly lenticular, somewhat wrinkled, yellow, rufescent. Umbilicus in the middle, obscure.

It is very ornamental when in flower, which it is the beginning of May, and the seeds ripen in July; afterwards the leaves die away, and the roots remain inactive till the following spring.

It is not easily kept, but thrives better in a bed of light loamy soil in a shady and rather moist situation than in pots. May be propagated by offsets, which the roots put out freely when they are in a loose moist soil and a shady situation; the best time to remove the roots and take away the offsets is in August, after the leaves and stalks are decayed, that they may be fixed well in their new situation before the frost comes on. It may also be propagated by seeds.

### CONVOLVULUS TRICOLOR.

SMALL CONVOLVULUS, OR TRAILING BINDWEED.

Pentandria Monogynia.—LINN.

Convolvulaceæ.—JUSS.

Stalks herbaceous, thick, about two feet long, not twining, but bending towards the ground, upon which many of the lower branches lie prostrate. Leaves sessile, lanceolate-ovate, smooth. The peduncles come out just above the leaves at the same joint, and on the same side; they are about two inches long, each sustaining one large open bell-shaped flower, of a fine blue colour, with a white bottom, varying to pure white, and sometimes beautifully variegated with both colours. The white flowers are succeeded by white seeds, but in the blue ones they are dark-coloured.

It is a very pretty annual, a native of Spain, Portugal, and Sicily, and very commonly cultivated in gardens, flowering in July and August.

The most usual colours of its blossom are blue, white, and yellow, whence its name of *tricolor*. It is propagated by seeds, which should be sown on the flower-borders in the spring, where the plants are to remain. They require no other care than to be thinned and weeded.

### ANGULOA SUPERBA.

SUPERB ANGULOA.

Gynandria.—LINN.

Orchideæ.

Herb sweet-scented, roots simple, whitish, terete; bulb, oblong, compressed, striate-costate, smooth; squamiform, sheathed, lanceolate, membranaceous. Leaves solitary, petiolate, erect, oblong-lanceolate, acuminate, edges wavy; underneath tri-nerved, prominent. Petioles channelled sulcate, angular, smooth; scape radical, few-flowered, shorter than the leaves, glabrous. Flowers alternate, large, pedicilate. Pedicels spathulate, smooth. Calyx sub-globose, six-parted, resupinate, spotted. Anther terminal, operculate. Pollen masses two, oblong. Ovary glabrous.

It is found growing on trees in Peru, sucking their sap by insinuating its roots beneath the bark, but vegetating in the soil which collects upon the forks of the branches.

It should be planted in pots filled with porous stones, a few decayed leaves, and knobs of bark taken fresh from the woods; but it requires very little water; and if the leaves turn yellow, it is a sign that they have either too much water or too much sun. It is easily propagated by dividing.

### CYCLAMEN COUM.

ROUND-LEAVED CYCLAMEN.

Pentandria Monogynia.—LINN.

Primulaceæ.—JUSS.

Leaves flat, smooth, and of a lucid green above, very red underneath in the beginning of winter, but the colour goes off gradually in the spring. Petioles short, weak. Berry covered with a capsule. Seeds numerous, somewhat egg-shaped, angular, attached to an egg-shaped free receptacle.

Grows wild in many parts of Italy and Germany, where the wild swine feed on its bulbs, which are round, flattened, and solid, and as large as pigeon's eggs.

It is sometimes found with white flowers; if the season be mild, or the plants sheltered from the inclemency of the weather, this species will flower as early as February, or much earlier by artificial heat, and is peculiarly adapted for pots, and for chamber decoration in spring.

*C. eoum* admits of but little increase by its roots. The best method of propagating it is by seed, which should be sown soon after they are ripe in boxes or pots, and covered about half an inch deep, placing them where they may have only the morning sun till the beginning of September, when they may be removed to a warmer exposure.

As it grows naturally in woods and shady places, it will thrive best in a mixture of bog-earth and loam placed in a north border; if planted in the open border, it will require to be covered with a hand-glass during winter, and in the spring, when in bloom.

## PROTEA NANA.

DWARF OR ROSACEOUS PROTEA.

Tetrandria Monogynia.—Linn.

Proteaceæ.—Juss.

Stem erect, two or three feet high, much branched. Branches tawny, smooth, round, leafy, loosely spreading. Leaves numerous, scattered, sessile, simple, scarcely an inch long, linear, entire, each tipped with a sharp spine. Flowers terminal, solitary, drooping, of an elegant rosaceous form and colour, the imbricated spreading leaves of the calyx being of a shining crimson, their edges finely fringed. The numerous plants form a dense cone, shorter than the calyx. They are reddish, fringed with golden trairs. The styles of the outermost first release themselves from the confinement of the closed tips of the corolla, and are smooth, long, yellow, and rigid.

The outer bracteas are disposed into a very regular rose, and constitute the chief beauty of the flower, which has no smell. It flowers here, as at the Cape of Good Hope, of which it is a native in dry elevated places, from the latter end of spring to the middle of summer, and may be propagated by cuttings planted in sandy loam, under a bell-glass, during the months of May and June.

## BIGNONIA UNDULATA.

WAVE-LEAVED ORANGE TRUMPET-FLOWER.

Didynamia Angiospermia.—Linn.

Bignoniaceæ.—Juss.

Stem erect. Leaves numerous, simple, lanceolate, waved, scattered, on simple stalks, acute, entire, smooth. Flowers interminal simple umbels, accompanied by small lanceolate bracteas. Calyx slightly downy, in five shallow segments. Corolla large, short, and spreading. Stamens four, with an abortive twisted filament besides. Pod a foot long, linear, acute, smooth.

This noble species of *Bignonia* is a native of the northern forests of Hindostan, where it grows to a large tree, flowering in March and April, and ripening seeds in May. The provincial name *suna mookee* means golden-mouthed.

## EPACRIS GRANDIFLORA.

CRIMSON MOUNTAIN-BLOSSOM.

Pentandria Monogynia,—Linn.

Epacrideæ.—R. Brown.

Stem shrubby, four or five feet high, much branched. Branches round, downy, leafy. Leaves evergreen, hard, rigid, nnmerous, alternate, on short downy stalks, recurved, heart-shaped, with a spinous point, entire, thick-edged, obscurely ribbed, nearly smooth. Flowers axillary, solitary, pendulous, on short scaly stalks, leaning all one way. Calyx imbricated; its leaves ovate, sharp pointed, fringed; the five innermost longest, narrowest, and equal. Corolla an inch long, tubular, smooth, with a regular-spreading, five-cleft, acute, white border, the tube of an elegant crimson. Stamens short, in the mouth of the tube. Anthers brown, two-lobed, bursting longitudinally. Pollen yellow. Germen superior, with five blunt scales at its base. Style thread-shaped, extended beyond the stamens, with a capitate stigma. Capsule of five hard, rigid, obtuse valves, with partitions from their centre. Seeds minute, angular.

The species of this beautiful genus seems to occupy the same place in the scale of Nature in New Holland that the Heath do at the Cape of Good Hope. *E. grandiflora* grows in a dry sandy soil, flowering in October, and is not uncommon about Fort Jackson.

With us this most elegant plant frequently begins to flower in April, and continues two or three months before it is quite over, during the whole of which time nothing can be more beautiful. It requires a sandy peat soil, may be propagated by cuttings, and must be preserved in an airy green-house during the winter.

## CONVOLVULUS JALAPA.

MEXICAN OR JALAP BINDWEED.

Pentandria Monogynia.—Linn.

Convolvulaceæ.—Juss.

Root large, of an irregular oblong shape, and full of milky juice. Stems numerous, herbaceous, slender, triangular, twining, eight to ten feet high. Leaves varying in shape, cordate, angular, or oblong and pointed; they are smooth on the upper surface, hoary underneath, and stand on long petioles. Flowers large, plaited, bell-shaped, entire, standing on short axillary peduncles, each having one or more flowers of a rose-colour externally, and a dark purple within. Calyx of five oval, concave, pale green leaves. Anthers large, oblong, tapering, yellow. The filaments, which do not protrude beyond the tube, are slender, varying in length, covered at the base, with short purple hairs, and inserted into the corolla. The germen is oval, supporting a slender style, crowned with a roundish two-lobed stigma. Seeds covered with a very white down-like cotton.

The *C. Jalapa* is a native of Mexico. The medicinal virtue of jalap resides in the resin. The powdered root is the part used. It is in general a safe and efficacious cathartic. From 200,000 to 300,000 pounds are annually exported from Vera Cruz. In its wild state, the plant delights in a dry sandy soil, and flowers in August and September.

In this country it must be preserved in the bark-stove, is increased from slips or cuttings, and makes a very handsome appearance when covered with its beautiful showy flowers.

## SPIGELIA MARILANDICA.

MARYLAND WORM-GRASS, OR CAROLINA PINK.

Pentandria Monogynia.—Linn.

Gentianæ.—Juss.

The root is horizontal, and consists of numerous slender fibres, forming together a large bunch. When recent they are of a yellow colour, but become black in keeping. From the root proceed several erect, herbaceous, annual, smooth stems, four-sided, and of a reddish purple colour. Leaves opposite, sessile, ovato-acuminate, entire, smooth. The stem is terminated by a spike of flowers, ranged on one side of the foot-stalk, and supported on short peduncles. Calyx short, cut into five acute segments; corolla funnel-shaped, of a deep crimson externally, and pink within, having the five segments of the border of a yellow colour, tinged with green. Stamens five, shorter than the corolla. Anthers oblong, sagittate; germen superior, ovate; style the length of the corolla, terminated by a long fringed stigma. Capsule double, two-celled, and contains many seeds.

This plant, not less celebrated for its superior efficacy in destroying worms than admired for its beauty, is a native of the warmer parts of North America, flowering in June and July. It is not very common in our gardens, for although it is so hardy as to endure the cold of our ordinary winters in the open air, yet as it does not ripen seeds, the only way of propagating it is by parting of the roots; and as these do not make much increase by offsets, so the plants are rare, and scarcely to be kept in this country but by frequent importation. It delights in a moist soil, and must not be often transplanted.

3.Cyclamen Coum.

4.Dodecatheon Media.

5.Epacris grandiflora.

6.Spigelia Marilandica.

# GARDENING OPERATIONS FOR APRIL.

## KITCHEN GARDEN.

About the beginning of April the weather generally has become so mild and the days are so long, that much must now be left to the mere operations of nature, in so far as regards seeds and plants already consigned to the ground, although daily watchfulness is required to aid those efforts which nature so strenuously puts forward. But there are many plants and seeds still to be put into the earth, or that have still to be treated with some capital measure essential to their fruitfulness; so that there is not a day in any month in which the gardener's attention and labours can be dispensed with.

If the heat begin to decline in the cucumber and melon beds, they should receive linings, as has been directed in former months; for these plants will not yield fine fruit, or a plentiful crop, unless a proper heat is maintained in the beds. Air must be admitted every day, and a moderate watering given every four or five days, particularly to cucumbers; but melons should receive it sparingly, especially when their fruits are setting. Keep the plants clear of decayed leaves and flowers. When the sun shines so bright as to make the leaves flag, they should be shaded for two or three hours, during its greatest heat, with a thin mat, or a little loose hay, strewed thinly over the glasses. Make hot-beds on which to ridge out cucumbers or melons under hand glasses. Sow cabbages and cabbage lettuces any time this month. Should the lettuces that were sown last month stand too thick, they may be thinned out and transplanted at the distance of about ten inches from each other, being watered occasionally till they take root. Early kidney-beans may be planted toward the end of the month, in a well sheltered situation, exposed to the south. The tall running kinds should not be planted till next month. The cabbage and savoy plants which were sown in February and March, should be thinned and transplanted into beds, to gain strength before their final transplantation; and those which have stood the winter may be planted where they are to remain. Cauliflower plants under hand-glasses should have some earth drawn up about their stems, and should be exposed to the open air during the day in good weather. Young plants of broccoli, which were sown last month, may be planted out at the distance of two or three inches from one another, to acquire strength for final transplantation. Some plants of last year's sowing, which produced heads this spring, should be allowed to remain for seed, which will ripen in August.

## FRUIT GARDEN.

In late seasons, pear, plum, and cherry trees may still be planted, and apricot, peach, and nectarine; but it should be done as early in the month as possible, for if any of these have advanced much in growth before they are transplanted, they will not push freely in the course of the summer, and will be liable to be injured by drought. Where pruning has been neglected, it may still be done, but the sooner the better, for many fruit trees will now be in flower. Fruit trees should still be protected in cold weather. All ill-placed shoots should be rubbed off, and the young fruit on apricot trees, where set too thick, should be thinned.

Look over the vines trained on walls about the end of the month, and rub off the young shoots which proceed from the old wood, unless they happen to be situated where a supply of young wood is wanted; likewise where two shoots proceed from the same eye on branches of the last year's growth, let the weakest be rubbed off. Stakes should be placed beside the vines in the vineyard, to which they should be tied, and the ground between the rows should be kept perfectly free from weeds.

In a dissertation on the growth of wine in England, by F. X. Visper, printed at Bath, 1786, there is a method of training vines along the surface of the ground, proposed, which seems well adapted to the northerly climate of Britain, and for which the Rev. M. L. Broeg obtained a patent. Mr. Visper acknowledges that he took the first hint from the following passage, from Lord Bacon:—"The lowness of the fruit boughs makes the fruit greater, and causes it to ripen better; for we always see in apricots, peaches, and mello-cottens, upon a wall, the largest fruit is towards the bottom; and in France, the grapes that make the wine grow upon low vines bound to small stakes, while the raised vines in arbours make verjuice." He adds, "It is reported that in some places vines are suffered to grow like herbs, spreading upon the ground, and the grapes of these vines are very large; it were proper to try whether plants usually sustained by props, will not bear leaves and fruit if laid along the ground."

## THE FLOWER GARDEN AND PLEASURE GROUND.

Sow and transplant tender annuals; protect hyacinths, ranunculuses, and anemones, planted in beds, from heavy rain and frost, as directed in former months; likewise where they are in flower, from very bright sunshine, from about two hours before till two or three hours after noon; but in this case the covering should be raised to a considerable height, to admit air, and allow them to be viewed. Plant tuberoses in a hot-bed or hot-house, and give them but little water till they have come above ground. Evergreen shrubs and trees may be planted still, but the earlier in the month the better. Grass walks and lawns should be poled, rolled, and mown. Gravel walks should be broken up and turned.

## NURSERY.

Look over newly engrafted trees, and see if the clay keeps close about the grafts, as it is apt to crack and fall off; and when it is found in a bad state, so as to admit the rain or the air to the graft, remove it, and apply fresh clay in its stead. All shoots which rise from the stalk below the graft must be taken off whenever they are produced; for if permitted to remain, they would rob the graft of nourishment, and prevent it from shooting freely. Trees that were budded last year, will now begin to push out the first shoots. Should they be infested with insects, so as to cause any of their leaves to curl, these should be picked off, and pains taken to destroy the vermin. Shoots that proceed from the stock under the bud must be rubbed off as soon as they appear. The transplanting of young trees and shrubs from the seed bed, or where they stand too thick, should be finished early in the month; and if very dry weather prevail, water should be given to seed-beds, cuttings, and lately transplanted trees and shrubs.

## GREEN-HOUSE AND HOT-HOUSE.

Air may be admitted and water given more freely than in the former months, because the plants will begin now to advance in growth; but in general the management must be nearly the same as recommended for March. A considerable degree of warmth, both in the bark-bed and the air of the hot-house, is requisite for fruiting pine-apple plants. Water may be more frequently given, and air admitted more freely, because the weather will be milder; in other respects they must be managed as directed for March. The succession pine-apple plants, or such as are to fruit next year, should be shifted into larger pots. When the plants are healthy, they should be turned out of the pots, with the ball of earth about their roots, as entire as possible, and put into larger ones, with an additional quantity of fresh earth; but should the plants be sickly, infested with insects, or appear to have bad roots, the whole of the earth should be shaken off, the roots trimmed, and a few of the under leaves stripped off the stem, and the plants then put into pots, filled entirely with fresh earth. After they have been thus shifted, they should have a moderate quantity of water given them frequently, which will promote their growth. The young pine-apple plants which were raised from suckers or crowns last season, should likewise be shifted into larger pots, if their roots appear to have filled those in which they have stood during the winter; if healthy, they should be turned out of the pots with

the ball of earth entire ; if otherwise, they must be treated like the succession plants as above.

This is a proper season for propagating hot-house plants by cuttings, layers, &c., or for sowing their seeds. Cuttings of green-house plants may likewise be struck in the bark-bed of the hot-house, and kept there till fit for transplanting.

## CULTURE OF MEDICINAL PLANTS.

Many plants are employed for medicinal purposes, and are cultivated by the gardener, either expressly for sale to apothecaries, or as ornamental flowers and shrubs ; and several have become subjects of garden cultivation, from the difficulty of procuring them in their natural place of growth, or from the high price at which they are otherwise purchased. We do not purpose attempting to enumerate all those that may be applied to a healing purpose : for what plant is there which may not possess some medicinal virtue ? Even many of those most commonly used for other purposes, are also employed for this particular end : such as garlic, horse-radish, lettuce, mustard, sage, mint, balm, &c. Those now to be mentioned, however, are in an especial degree medicinal, and their culture simple. They are either herbaceous or shrubby. Of the former we particularize saffron, thorn-apple, henbane, belladonna, angelica, anise, rhubarb, poppy, aconite, hellebore, peppermint, pennyroyal, fox-glove, marsh-mallow, liquorice, tansy, and chamomile ; and of the latter, rosemary, lavender, mezereon, hyssop, rue, and rhododendron.

The bulbous-rooted plant producing saffron (*crocus autumnalis*), was formerly cultivated to a considerable extent in Essex and Cambridgeshire, and might with advantage be introduced into gardens that have a sandy soil. It flowers in August and September ; and after the styles have been removed for saffron, and the flowers and the leaves are decayed, the roots should be taken up and kept in a dry, cool place, to be transplanted in the following spring.

Thorn-apple (*datura stramonium*, Lin.) and henbane (*hyoscyamus niger*, Lin.) are often found by way-sides, where heaps of dung or compost manure have been formed. They may, therefore, be readily cultivated in moderately rich garden-ground, by sowing the seeds in the spring, and transplanting at about eighteen inches distance. They require no other care but keeping free from weeds.

Deadly night-shade (*atropa belladonna*, Lin.) is a plant of the same kind as the two preceding, and is occasionally, but not frequently, met with in similar situations. It may be produced in the garden by sowing the seeds taken from the ripe berries. Though a virulent poison, it is found serviceable in particular diseases.

Angelica (*angelica archangelica*, Lin.) and anise (*pimpinella anisum*, Lin.) are umbelliferous plants occasionally cultivated, the former for its stalks, which are seldom used now except as a domestic remedy, the latter for its seed. They are both raised from seed ; but angelica will grow vigorously in a damp, rich soil : while anise is more tender, and requires a warm border. On this account, the latter is cultivated for profit in the warmer countries of Europe. When raised in Britain, the seeds should be sown in April.

Rhubarb (*rheum rhaponticum*, Lin.) is now much cultivated in British gardens, more for the sake of its leafy stalks, which form a good substitute for some of the acid fruits, in making tarts, than for its roots, though these, where properly managed, are little inferior to the foreign rhubarb. It may be raised from seed, or propagated by offsets from the root, and agrees well with a rich sandy soil. As the plant spreads much and grows high, it should have a good depth of soil and plenty of room.

White poppy (*papaver somniferum*, Lin.) Good opium may be obtained from the unripe seed-heads of this plant, as it is produced in our gardens : and it has been occasionally cultivated to some extent for the purposes of producing that valuable drug. It requires a rich, loamy soil, and the seed, saved from the largest heads in the autumn, should be sown in spring in a warm situation. The seedlings should be transplanted into a border where they will enjoy the full sunshine, at eighteen inches or two feet distance from each other, and the ground must be often hoed to keep down weeds. No more water than is necessary to promote their growth should be given, as much moisture diminishes the viscidity of the juice. When the heads have attained their full size, opium may be obtained from them by making slight longitudinal scarifications over night, and scraping off the hardened juice before sunset next day. It may be here remarked, that a similar inspissated juice may be collected in the same way from the stems of the common lettuce, when the plant has begun to shoot for flowering.

Aconite or monkshood (*aconitum neomontanum*, Lin.) is a hardy perennial, affects a shady situation, and grows well under trees. It is raised from seed, which should be sown in autumn, and the plants removed the following spring, and transplanted at the distance of fourteen inches from each other. They need little attention, except weeding and watering : and if the decayed stalks be cut down on the approach of winter, fresh ones will be produced the following spring.

Black hellebore (*helleborus niger*, Lin.), commonly called Christmas rose, is a highly ornamental plant, which flowers very early in the spring, and is valuable for the medical use made of its roots. It thrives best in a sandy or gravelly loam without manure, and is propagated by parting the roots and planting them in an open situation. In severe winters it requires to be sheltered for a few weeks under hand-glasses.

Peppermint (*mentha piperita*, Lin.) and penny-royal (*mentha palegium*, Lin.) are cultivated nearly in the same way as mint, but require a moist soil. As they spread much, a few roots will soon stock a bed. The stalks should be cut for use while in flower, tied in small bunches, and hung in a shady sheltered place to dry.

The fox-glove (*digitalis purpurea*, Lin.), an indigenous biennial plant, is now so much used in medicine, and is such an ornamental flowering plant, that it has generally obtained a place in the flower garden and shrubbery. Its favourite soil is a gravelly loam without manure, and it is produced from seed sown in spring, and does not require any particular management.

Marsh-mallow (*althæa officinalis*, Lin.) is a hardy perennial, which thrives well in any soil, but grows to the largest size in damp situations. It is propagated by seeds sown in the spring, or offsets taken from the root after the stalks decay in autumn, and planted at the distance of two feet apart from each other, as the roots, for which it is chiefly cultivated, spread very much.

Liquorice (*glycyrrhiza glabra*, Lin.) grows well in a sandy loam, and may be propagated by slips from the root, which should be planted in autumn, at a good distance from each oth It should be seldom watered, as too much moisture rots the roots. The roots may be taken up as wanted, but kept wet in moist sand. The root deserves cultivation in this country, as what grows in Britain is generally preferred to that imported from abroad.

Tansy (*tanacetum vulgare*, Lin.) grows well in any soil that is not very moist, and may be propagated to any extent by slips from the roots planted in spring. It should be cut down every autumn, as the young shoots are most useful.

Chamomile (*anthemis nobilis*, Lin.) is most cultivated in the neighbourhood of London ; but that produced in Scotland is considered the strongest. It agrees best with poor soil, and is propagated by parting the roots in spring. These are planted in beds ten inches asunder, and require watering till they are firmly rooted. The flowers are gathered before they begin to wither, and dried in a shady place.

Rosemary (*rosmarinus officinalis*, Lin.) and lavender (*lavandula spica*, Lin.) are shrubby plants, which, though natives of Southern Europe, bear our winters well, and are reckoned among those that ornament the flower garden and shrubbery.

They both agree best with a dry, poor soil, and are propagated by slips or cuttings planted in spring: but the former requires shelter, and grows best near a wall, while the latter affects an open situation. Lavender is most valued for its flowering spikes, which retain their odour a long time when dry. New plantations of this should be made every four years.

Mezereon, or spurge laurel, (*daphne mezereum*, Lin.) is an ornamental, early flowering shrub, the bark of which forms an ingredient in diet-drinks. It is hardy, but grows best in a shady spot, and is propagated by slips or suckers in autumn.

Hyssop (*hysopus officinalis*, Lin.), so much employed in domestic medicine as still to occupy a place in apothecaries' shops, grows best in a poor, dry, or even strong soil, and is produced from seed, or propagated by slips or cuttings in the spring.

Rue (*ruta graveoleus*, Lin.) is in little less request among the Lady Bountifuls for worms, than hyssop for coughs. It is cultivated like rosemary and lavender, but should be occasionally headed to make it grow close and bushy.

Rhododendron (*rhododendron chrysanthum*, Lin.), a highly ornamental shrub; has been introduced into this country from the mountainous parts of Northern Asia. Being a hardy plant, it is easily cultivated by slips planted in spring, in an open situation, and a moderately good soil.

## ON THE SOWING OF WHEAT.

Wheat is certainly the staple article of food for man. But of the many species that may be enumerated of the genus *Triticum*, winter or lammas wheat (triticum hybernum) is by far the most important in this country. We shall confine our few practical observations to this species, and the manner in which it is sown.

The varieties or kinds of winter wheat are very numerous, climate, situation, and soil effecting almost endless differences upon it. They are distinguished, however, so much by local terms, owing to their qualities, places where they are cultivated, and other incidental circumstances, that an attempt to enumerate them, under intelligible names for every district of the kingdom, would be in vain. But there is one distinction which is sufficient for their description, in so far as their uses in agriculture are concerned, and this is distinguishing them into red and white, according to the colour of their seeds. The white produces a superior quality of grain, but the red is more hardy.

When this species is called spring-wheat, it is only because it is sown at that season, the period of sowing alone conferring the names of spring and lammas or winter-wheat, as the case may be, upon the same species. It is curious enough, that it undergoes a change as to the time it requires to be in the ground ere ripening, according to the season when it has been sown. But it is the produce of wheat sown in spring that should again be sown at that season, rather than the produce of that which had been sown in autumn, the change of habit, as may be naturally supposed, being established by degrees. There are minor varieties which, however, degenerate, unless preserved by those circumstances of culture that particularly suit them, and therefore there have been valuable kinds which are now bad.

Modern skill and management have rendered every sort of soil capable of producing wheat; but that which is more or less clayey is the most suitable. One great argument against the culture of wheat on light soils, must ever be, that these can be turned to greater advantage for the rearing of other sorts of crop. A few other general observations may be stated as to its culture. Being such a valuable production, it stands, as might be supposed, particularly in need of great attention in its propagation, fertility and good husbandry in every shape being more essential to the securing a good crop of it than as regards any other sort of corn. The better the condition is to which wheat-land is brought, the better and more profitable will the returns in wheat be. A very high elevation, however, does not in any condition suit it. If possible, never delay the sowing of this seed till spring, if the land can be prepared for it before winter. After turnips or such crops as are not removed till near the spring, it must be delayed; but after a fallow, beans, or potatoes, the obstacle to an autumn sowing is timeously removed, and no ordinary excuse can be urged for a delay till spring.

Autumn sowing should, if possible, in this country, take place from the middle to the end of September; and whatever may have been said on the merits and necessity of fallowing, wheat can never find such a suitable place as after such a process. Let it be sown, however, as soon as convenient after the seed-furrow has been given to the land. It is usual to pickle the seeds to prevent the disease called *smut*. This may be done according to the following rules:—Steep about a bushel of the grain at a time in stale urine from five to ten minutes. Drain it a little, and spread it upon a floor, each steeping forming a layer upon layers, and sift hot lime upon each. The lime dries the seed, and probably aids in the preventive process against the disease. As soon as thus dried, it should be sown.

Sowing is either broad cast or in rows. The broad cast may be done by the hand, or by a machine that has been invented for the purpose. When by the hand out of a sheet, it is slung over the right shoulder, if the sower be right-handed; he then walks with measured steps, and scatters the seed with wonderful regularity, if he be experienced. Drilling, however, in lighter soils, if overrun with weeds, is a great improvement, the intervals between the rows admitting the operations of the hoe during the earlier growth of the wheat. In Norfolk, Suffolk, and, indeed, throughout many parts of England, this process is preferred; in Scotland and the north of England, broadcast is the usual system. The distance between the drills is from nine to twelve inches. A single or double turn of the harrow is sufficient to cover the seeds, according to this style of sowing. When sown broadcast, several turns are requisite, but when the seeds are once covered, it is not advisable to attempt doing more to break any remaining roughness of clod. One turn across is at least necessary. Water-furrow the land, and clear away by a spade every impediment to the course of the water between the ridges and to the main conduits, immediately after the last turn of the harrows has finished the sowing process over the field. Nothing is more requisite than thus to leave off and complete the important operation that has consigned to the fertile earth the germs that are to send forth an abundant return for the becoming care bestowed; and nothing is more beautiful, or more the subject of fine associations, than a field thus dressed up, and, as it were, put into tender keeping.

We should have noticed a practice which prevails in some parts of England in the mode of putting wheat into the ground. This is by dibbling the seed; and though it seems an unfarmer-like process, it yet answers extremely well on light or sandy soils. The wheat is planted upon the clover-lea, the furrow-slice having been laid flat. A light roller is passed over the dibbled seed, or a bush-harrow. A bushel to a bushel and a half is allowed the acre; whereas, from two to three bushels are required in drill-sowing. The dibbler goes backwards with an iron dibble in each hand, and strikes holes as he walks; and children may drop in the seed.

Such are the ordinary styles in which that invaluable grain which we have been speaking of is sown in this country; and although the account here given can afford no instruction to the skilful farmer, it may be looked upon as an example of describing one of those simple, beautiful, and interesting processes that nothing but skill can direct or perform.

## ON THE PRINCIPLES OF ORNAMENTAL GARDENING.

It is highly probable that gardening was one of the first arts that succeeded to that of building dwellings for man. Culinary and afterwards medicinal herbs, would be cultivated by every family, when the inhabitants of the earth were but few and much scattered. As settlements increased, the orchard and vineyard would follow. There is reason to believe that matters would thus remain for many centuries, when these different branches would, under the princes of tribes, be mixed, but neither in an advantageous nor beautiful manner. Even Homer's charming description of the Garden of Alcinous, presents us with little better, if the bewitching poetry be left out of consideration, than a small orchard and vineyard, with some beds of herbs, and two fountains that watered them, inclosed within a quick-set hedge. We read also of Solomon's gardens in still more ancient times; and again in Scripture of the hanging gardens of Babylon. But we need not speculate upon the principles observed in these and similar examples, presuming, as we may fairly do, that they were very different from what in modern times has in England been considered works, according to the sound and becoming rules of the art. Among the Grecks and the Romans, we do not find any nearer approach to our present accepted principles. The former had shaded walks, but we do not perceive from the descriptions of them that there was any artificial arrangement of objects, so as to imitate nature, while the latter seem to have had their square inclosures regularly ornamented, and elegantly symmetrical, such as become the narrow spaces allotted to a city residence.

The custom of making square gardens, inclosed with walls, which had been at an early period established, was long persisted in. As this style excluded nature and prospect, something was necessary to make up for such an unanimated partition. Fountains had been long known, for their real uses; but disguised from the fastidious sight. These, however, suggested more costly attempts at the same kind of artifice; and sculptured marbles were made to throw their waters into the air, thus opposing ostentatiously the ways of nature. Regular canals, defensive balustrades, vases, and statues; embroidered parterres, and the formal shears, united to complete these impotent displays, and to furnish the most perfect examples of false taste. It was comparatively of a very late date when the present principles of the art were introduced. It has been remarked that Milton, with a prophetic eye of taste, conceived and recognized these with wonderful accuracy. But it was not for a considerable period afterwards, that the giants, animals, monsters, coats of arms, and mottos in yew, box, and holly, were exploded, and that capital step in breaking loose from rigid symmetry taken, by the destruction of walls for boundaries, and the invention of fosses, an attempt then deemed so astonishing, that the common people called them Ha! Has! to express their surprise at finding a hidden and unperceived check to their walks. Levelling, mowing, and rolling, followed this remarkable expedient and simple enchantment. The sunk-fence ascertained the specific garden; but that it might not draw too obvious a line of distinction between the neat and the rude, the contiguous outlying parts came to be included in a kind of general design; and when nature was taken into the plan, under improvements, every step that was made pointed out new beauties, and inspired new ideas. At this moment Kent appeared, who saw all nature to be a garden. He felt the delicious contrast of hill and valley, of gentle swell and concave scoop, and made every feature subservient to his art. Perspective, and light and shade, were the great principles which he worked upon. The living landscape was thus chastened or polished, not transformed. He routed professed by concealed art.

It will be perceived from these few observations, which may be found beautifully amplified in Walpole's History of Modern Gardening—subjoined to one of the volumes of his Anecdotes of Painting—that gardening no longer is confined to the spots or objects from which it at first took its name. The purposes of domestic convenience do not now point out all its capabilities and ends, but the modern art regulates whatever is great, elegant, or characteristic in the embellishment and disposition of a park, a farm, a forest, &c. It is therefore a *fine* art—an exertion of fancy—a subject of taste; and as such has been brought to great perfection in England.

It has been usual by the best writers who have studied deeply the objects which Gardening, in the extended sense now used by the term, has to contemplate, to divide them into *natural* and *factitious:* the former are Ground, Wood, Water, and Rocks; the latter Buildings and their appendages, such as fences, walks, roads, bridges, and seats. It will at once be seen, even from these few simple materials, that nature may be improved to an unlimited extent, and with an infinitude of variations. It may be added, that animate objects are circumstances of beauty in the scenes of nature, and are, therefore, not unworthy of the attention of the Gardener. Still the genius of the place and scene is always to be observed; to force is hazardous, to contradict is sure to be unsuccessful. A few observations drawn from the highest authorities on Modern Gardening, we now proceed to offer to our readers. To those who are little acquainted with its principles and materials, these will be calculated to be extremely useful, by leading them to pursue the study under the guidance of their own imaginations and tastes; while to the masters in the art, a recapitulation of established rules cannot but be refreshing, inasmuch as it must recal the remembrance of the manner in which such rational principles and simple materials were first made to appear to them objects of art, as also the use which they have since made of such rudimental knowledge, by an enlightened and tasteful judgment.

*Ground* may be either a swell, a hollow, or a level. The two former are forms of more variety, and may, therefore, be admitted to a greater extent than the latter; but levels are not totally inadmissible, although a continued range of the noblest wood will not cure the insipidity of a flat. As long as it remains it depends on the objects around for all its variety and beauty. But the number of degrees and combinations into which swells and hollows may be cast, is infinite, and generally pleasing. Those forms, only in each, which are perfectly regular, must be avoided. In ground which lies most beautifully, the hollow will generally however prevail. Within the same compass, it shews more surface than a swell. Variety and even contrast are necessary to beauty; yet variety must not degenerate into inconsistency, nor contrast into contradiction; within the extremes nature supplies an inexhaustible fund. Of what ground ought to be, Mr. Gilpin, in his observations on the Wye, has the following remarks.—"Nothing, says he, "gives so just an idea of the beautiful swellings of ground as those of water, where it has sufficient room to undulate and expand. In ground, which is composed of very refractory materials, you are presented often with harsh lines, angular insertions, and disagreeable abruptnesses. In water, whether in gentle or in agitated motion, all is easy, all is softened into itself; and the hills and valleys play into each other in a variety of the most beautiful forms. In agitated water, abruptnesses, indeed, there are, but yet they are such abruptnesses as in some sort or other unite properly with the surface around them, and are, on the whole, peculiarly harmonious. Now, if the ocean in any of these agitations and swellings could be arrested and fixed, it would produce that pleasing variety which we admire in ground. Hence it is common to fetch our images from water, and apply them to land. We talk of an undulating line, a pleasing lawn, and a billowy surface; and give a much stronger and more adequate idea by such imagery, than plain language could possibly present."

Broken ground may be generally reduced to a lawn. Swamps may be drained or covered with water, and lawns may be variegated by wood or by water, but the greater inequalities of

nature must seldom be meddled with. General considerations are also never to interfere with extraordinary great effects, which rise superior to all regulations, and perhaps owe part of their force to their deviation from them. In scenes licentiously wild, nature, not content with contrast, forces even contradictions to unite.

*Wood* is another of those materials with which gardening is conversant. A single tree is in itself the most beautiful object of inanimate nature; a thick large wood, commanded from an eminence, or seen from below, hanging on the side of a hill, must be a still more imposing sight. Both trees and shrubs are embraced. They are of different shapes, greens, and growths; but in massing and mingling their different characters, there must be such a variety of capabilities for taste to exert itself, that we cannot here attempt any precise rules. We shall merely consider plantations, whether as a *wood*, properly so speaking, a *grove*, or a *clump*. A wood is composed both of trees and shrubs or underwood, covering a considerable space. A grove consists of trees without underwood. A clump differs from either in extent, and it may be close when it is sometimes called a thicket, or open when it is a group of trees.

It has been said, that the surface of a wood, commanded from an eminence, or seen from below hanging on the side of a hill, is an imposing object. But the latter view is generally the more interesting. Its aspiring stretch gives it an air of greatness: while its termination is generally that of the horizon—a more splendid boundary than a wood commanded from an eminence can possess, although in this last case a wonderful effect is produced by its windings out of sight; on the other hand, the brow of a hill may intercept and injure the effect of the upward view. The varieties of surface are essential to the beauty of it, taken in either view; the different growths of trees and different tints break this uniformity. In raising a young wood, these reliefs and inequalities may be perfectly secured by judgment. In old woods, which may be thinned or thickened, a similar result may be effected. The number of beautiful forms and agreeable masses is so abundant, that where one cannot be introduced, another always may. Groups and masses must, however, bear a respect to the character of the scene and the magnitude of the wood. In a highly romantic and broken situation, rudeness, not greatness, is the idea that prevails; and that which would be unity in the one, will not in the other. The inequalities of the ground may be also marked by those of the wood. Strong contrasts are here consistent, and abrupt ideas are naturally connected. There are many other ways by which the effect of the surface of a wood may affect our sentiments, which we need not tarry to point out, since every close observer of scenery can send his thoughts abroad on the subject. For instance, woods of thin forest trees may please or displease, just according to the point they are seen from, or from the character of the tree as suiting a half-solitary position, or otherwise.

The outline of a wood is more in our power than its surface, and therefore calls for more attention. It must not consist of a succession of easy sweeps and gentle rounds. A straight or strictly serpentine line are equally bad. It must not be a number of regularities put together in a disorderly manner, and equally distant from the beautiful both of art and of nature. The true character of a grand outline depends more upon variety than succession. Now this may be obtained by different devices. Prominences and recesses—detached clumps, and skirting trees—may each and all be made to add character to a wood; to lighten the unwieldiness of its bulk, and to blend grace with grandeur.

Beauty is the character of a *grove*; it is an assemblage of fine trees, which are lovely objects, where every individual retains much of its own peculiar elegance, and whatever it loses is transferred to the superior beauty of the whole. To a grove, therefore, which admits of endless variety in the disposition of the trees, differences in their shapes and their tints are seldom very important, and sometimes they are detrimental. Strong contrasts scatter trees that are thinly planted, and which have not the connection of underwood; they no longer form one plantation—they are a number of single trees. A thick grove is not exposed to this mischief, and certain situations may recommend different shapes and different greens for their effects upon the *surface;* but in the *outline* they are seldom much regarded. Even varieties in the form of the line do not always engage the attention. But, besides being beautiful, as an object, a grove is a delightful spot to walk in; and the choice and disposition of the trees for effects *within* are, therefore, a principal consideration. Mere irregularity will not please; strict order is there more agreeable than absolute confusion. The trees should gather into groups, or stand in various irregular lines, and describe various figures; the intervals between them should be contrasted both in shape and in dimensions. In the forms and varieties of the groups, lines, and openings, principally consists the interior beauty of a grove. The consequence of variety in the disposition is variety in the light and shade of the grove, which may be improved by the choice of the trees. Some are impenetrable to the fiercest sun-beam; others let in here and there a ray between the large masses of their foliage; and others, thin both of boughs and of leaves, only checquer the ground.

*Clumps* differ only in extent from woods, if they are close: or from groves, if they are open. They are small woods and small groves, governed by the same principles as the larger, after allowances made for their dimensions. Let it be observed, that by the term *clump*, is not to be understood the round and oval shapes that often pass by that name, but a small irregular mass, or a cluster of groups, which may contain either trees alone, or trees and shrubs. Clumps, besides the properties they have in common with woods or with groves, have others peculiar to themselves.

They are either independent or relative; when independent, their beauty, as single objects, is solely to be attended to: when relative, the beauty of the individuals must be sacrificed to the effect of the whole, which is the greater consideration. The least clump that can be is of two trees, and the best effect they can have is that their heads should appear one large tree. Three trees must form either a right line or a triangle, and their distances, to disguise the regularity, should be different. Distinctions in their shapes, and variety in their growths, contribute to this end. Every apparent artifice affecting the objects of nature, disgusts; and clumps are such distinguished objects, and so liable to the suspicion of having been placed on purpose to be distinguished, that irregularity in their composition is more important to them than to a wood or a grove. The extent and outline of a wood or a grove engage the attention more than the extremities: but in clumps the extremities are of most consequence. A multiplicity of clumps, when each is an independent object, seldom seems natural; yet a number of them may be admitted, if they bear a relation to each other: if between them they form beautiful glades: if altogether they cast an extensive lawn into an irregular shape, the effect prevents any scrutiny into the means of producing it. In that case every consideration must give way to the beauty of the whole. But clumps below the eye must, in all cases, lose some of their principal beauties. One peculiarity of clumps is the facility with which they admit a mixture of trees and shrubs, of wood and of grove; in short, of every species of plantation.

Single trees also deserve attention, on account particularly of the proportion that is to be maintained between the spot intended to be occupied and the object to be there placed; and if the desired effect can be attained by a single tree, the simplicity of the means recommends it. They may occasionally be applied to most of the purposes for which clumps are used, may be an independent object, may interrupt a continued line, or decorate an extent of space. The situation of single trees is the first consideration, and differences in the distances between them their greatest variety. Their situations will frequently determine the species best suited; but both distance and species

will, in very many cases, yield to the trees already on the spot: for a single young tree for many years produces no effect at all.

*Water* is so capital a feature in landscape gardening, that it is always to be regretted when it is wanting. So various are the characters which this element can assume, that there is scarcely an idea in which it may not occur, or an impression which it cannot enforce. All water is either *running* or *stagnated*. Running waters are either a rivulet, a rill, or a river; and these differ only in breadth. Stagnated water forms a lake or a pool, which differ only in extent. The characteristic property of running water is progress; of stagnated, circuity: the one stretches into length, the other spreads over space. But it is not necessary that the whole circumference of a lake be seen, or that no bounds be set to the prospect of a river; on the contrary, the latter is never more beautiful than when it is lost in a wood, or retires behind a hill from the view: the former never appears so great, as when its termination is concealed: the shape, not the close, denotes the character.

A lake cannot be too large as a subject of description or of contemplation; but the eye receives little satisfaction when it has not a form on which to rest. Even the ocean hardly compensates, by all its grandeur, for this want. An artificial lake again may be comparatively extravagant in its dimensions. It may be so out of proportion to its appendages as to seem a waste of water: if this be the case, and if a flatness of shore beyond it adds still more to the dreariness of the scene, wood to raise the banks, and objects to distinguish them, are the remedies. If the lake be small, a low shore will in appearance increase the extent. But it is not necessary that the whole scene be bounded: if form be impressed on a considerable part, the eye can without disgust permit a large reach to stretch beyond its view. But mere form will not give delight; that depends upon the outline, which is capable of exquisite beauty, and the bays and the creeks, and the promontories, which are ordinary parts of that outline, together with the accidents of islands, of inlets, and of outlets to rivers, are in their shapes and combinations an inexhaustible fund of variety to lakes.

A river's banks cannot both be concave, without sinning against the character of water that runs, unless to make room for an island. All recesses in which the current is lost, are blemishes in a river: a bay is as exceptionable as a creek, whatever be the form; if it be a receptacle, not a passage, it is a symptom that the water rather spreads than proceeds. But a headland which only turns or contracts the stream, though it make a sort of bay, is not liable to the same objection: it suggests not the most distant idea of stagnation. A river requires a number of accompaniments. Profusion of ornament on a fictitious river, is a just imitation of cultivated nature. These observations, and many others that might be introduced relative to very large bodies of water, are applicable also to imitative examples in parks and gardens. For in these the water is generally imitative; or that which in the open country would be called a great pond, there assumes the name of a lake, while, though a real river may pass through a garden, yet still but a small portion of it is seen; and more frequently the semblance only of such a portion is substituted instead of the reality. But still the characteristic properties of lake and river must be observed, otherwise the fine effect is lost which large bodies of water are capable of producing.

A river flowing through a wood, which overspreads one continued surface, and a river between two woods, are in very different circumstances. In the latter case, the woods are separate. They may be contrasted in their forms and their characters, and the outline of each should be forcibly marked. In the former no outline ought to be discernable; for the river passes between trees, not between boundaries: and though in the progress of its course, the style of the plantations may be often changed, yet on the opposite banks a similarity should prevail, that the identity of the wood may never be doubtful.

Water is so universally and so deservedly admired in a prospect, that the most obvious thought in the management of it is to lay it as open as possible; and purposely to conceal it, would generally seem a severe self-denial: yet, so many beauties may attend its passage through a wood, that larger portions of it might be allowed to such retired scenes, than are commonly spared from the view, and the different parts in different styles would then be fine contrasts to each other.

If a large river may sometimes, a smaller current may, undoubtedly, often be conducted through a wood and garden. A rivulet may be of importance enough in a home scene, to be left open, but a rill is always most agreeable when most retired from public view. The characteristic excellencies of a large river are force and power rather than activity; that of a rill, agility and vivacity, which require attention, leisure, and silence, that the eye may pore upon the little beauties, and the ear listen to the low murmurs or tinklings of the stream, without interruption. Sudden changes in the breadth, are a species of its variety; and however fantastically the channel may be wreathed, contracted, and widened, it still appears to be natural. We find an amusement in tracing its course, and in seeing it force a passage through a narrow streight, expatiate on every opportunity, struggle with obstructions, and puzzle out its way. A rivulet, which is the mean between a river and a rill, partakes of the character of both; it is not licensed to the extravagance of the one, nor under the restraints of the other; it may have more frequent bends than a river, longer reaches than a rill.

The murmurs of a rill are amongst the most pleasing circumstances which attend it. If the head of the stream be rough, mere declivity will occasion a rippling noise. When the current drops down a descent, though but of a few inches, or forcibly bubbles up from a little hollow, it has a deep gurgling tone, not uniformly continued, but incessantly repeated, and therefore more pleasing than any. The roar of a cascade belongs to a large stream; but it may be produced by a rivulet to a considerable degree, while a rill cannot pretend to any such arousing effect by its fall.

*Rocks* are certainly a principal means for producing effect in scenery. But they are too stubborn and vast to submit to our controul. Yet, by the addition or removal of appendages which we can command, parts may be weakened or enforced. Their most distinguished features are dignity, terror, and fancy. The expressions of all are constantly wild, and sometimes a rocky scene is only wild, without pretensions to any particular character. Rills, rivulets, and cascades, abound among rocks: they are natural to the scene; and such scenes commonly require every accompaniment which can be procured for them. Rocks alone, unless they are particularly adapted to certain impressions, though they may surprise, cannot be long engaging, if the vigour of their character be not softened by circumstances which may belong either to these or to more cultivated spots; and when the dreariness is extreme, little streams and waterfalls are of themselves insufficient for the purpose. An intermixture of vegetation is also necessary, and on some occasions marks of inhabitants are proper. Yet too strong a force on the nature of the situation always fails. A winding path which appears to be worn, not cut, has more effect than a high road all artificial and level. The objects to be introduced must be equally distinct from solitude and population. A house placed at the edge of a precipice, any building on the pinnacle of a crag, makes that situation seem formidable which might otherwise have been unnoticed. A single rail on the brow of a perpendicular fall, or a common foot-bridge thrown over a cleft between rocks, has a still stronger effect. The imagination immediately transports the spectator to the spot. Sometimes a spot remarkable for nothing but its wildness is highly romantic, and when this wildness rises to fancy—when the most singular, the most opposite forms and combinations are thrown together, then a mixture also of several characters adds to the number of instances which occur of the inexhaustible variety of nature.

Such are the natural subjects or materials which present themselves to the hand of the artist in landscape or Ornamental

Gardening; and such are some of their capabilities in producing those scenes which adorned and cultivated nature has in store for the human mind to taste. The accompaniments which factitious materials furnish to those that are natural, fall now to be considered.

Of the factitious accompaniments in Ornamental Gardening, *Buildings* hold a prominent place. They were first introduced into gardens, there can be no doubt, merely to afford refuge from a sudden shower, and shelter from the wind. But they have since been converted into objects, and now the original use is too often forgotten in the greater purposes to which they are applied; they are considered as objects only, and the inside is entirely neglected. In a garden they ought, however, to be considered both as beautiful features and agreeable retreats. If a character becomes them, it is that of the scene around them, not that of their primitive application. A Grecian temple, or Gothic church, may adorn spots, where it would be affectation to preserve that solemnity which is proper to be kept up in places of devotion. Yet it would be bad taste to give to a barn the exterior of a church. But though the interior of buildings should not be disregarded, it is by their exterior that they become objects of ornament, and by which they are designed either to distinguish or to adorn the scenes to which they are applied. The differences between one wood, one lawn, one piece of water, and another, are not always very apparent. The several parts of a garden would therefore often be similar in aspect, if they were not distinguished and diversified by buildings; but these are so observable, and so easily retained in the memory, they mark the spots where they are pitched, and attract the relation of all around, so that parts thus distinguished can never be confounded together. Yet, it by no means follows that every scene must have its edifice; the water of one is sometimes a variety. The uniformity of a view may be broken by similar means, and on the same principle; when a wide heath, a dreary moor, or a continual plain, is in prospect, objects which catch the eye, supply the want of variety; and none are so effectual for this purpose as buildings. The design, however, must not be apparent. The merit of a cottage applied to this purpose, consists in its being free from the suspicion; and a few trees near it will both enlarge the object, and account for its position. Ruins are a hackneyed device, immediately detected, if modern, and lately erected for a picturesque purpose. Indeed an old ruin, unless the style be singular, or its dimensions extraordinary, will appear a blemish.

The semblance of an ancient British monument might be adapted to the same end, with little trouble and great effect. But no building ought to be introduced which may not in reality belong to such a situation. No Turkish mosques, no Egyptian pyramids, none imported from foreign countries and unusual here. The apparent artifice would destroy effect, which is so nice as to be weakened, if objects proper to produce it are displayed with too much ostentation. In a garden, where objects are intended only to adorn, every species of architecture may be admitted, from the Grecian down to the Chinese; and the choice is so free, that the mischief most to be apprehended is an abuse of this liberty by the multiplicity of buildings. Few scenes can bear more than two or three. In some, a single one has greater effect than any number; and a careless glimpse here and there, of such as belong to different parts, frequently enlivens the landscape with more spirit than those which are industriously shown. Great ostentation of buildings is a common error: though their symmetry and their beauties ought in general to be distinctly and fully seen, yet an oblique is sometimes better than a direct view; and they are often less agreeable objects when entire, than when they are bosomed in wood, as well as backed by it; thus thrown into perspective, thus grouped and accompanied, they may be as important as if they were quite exposed, and are, indeed, frequently more picturesque.

*Bridges* are beauties, but never where they are not wanted. A useless bridge is a deception, deceptions are frauds, and fraud is always hateful. A bridge without water is an absurdity; and half of one placed as an eye-trap is a paltry trick, which, though it may strike the stranger, cannot fail to disgust when the design and fraud are discovered. In low situations, and wherever water abounds, bridges become useful, and are, therefore, pleasing objects; they ought not to appear as an ornament only, but as answering an useful purpose. The walk or the road should be directed in such a manner as to cross the water at the point where the bridge will appear to the greatest advantage. In the construction of the bridges themselves, regard should be paid both to ornament and utility. A bridge is an artificial production, and ranks among the noblest of human inventions. Simplicity and firmness are the leading principles in its construction.

*Walks* must be guided by the points of view to which they lead, and the nature of the ground passed over. A walk ought to be made subservient to the natural impediments (the ground, wood, water, and rocks) which fall in its way, without appearing to have any direction of its own. On a dead level, and where there is the freest scope for taste, of course the winding sweeps and planted interruptions to a dead uniformity, will be felt as caused by natural impediments. The paths of the Negroes and the Indians are always crooked, crossed, and tortuous: and those of the brute creation are very similar.

*Seats* have a twofold purpose; they are useful as places of rest and conversation, and as guides to those points at which the beauties of the surrounding scene are favourably disclosed. Every point of view should be marked with a seat; and, generally speaking, no seat ought to appear but in some favourable point of view. In the ruder scenes of neglected nature, the simple trunk, rough from the woodman's hands, and the stools of rooted trees, without any other marks of tools upon them than those of the saw that severed them from their stems, are seats in character; and in romantic or recluse situations, the cave or the grotto are admissible. But wherever the designs of art have been executed upon the natural objects of the place, the seat and every other artificial accompaniment ought to be in unison; and whether the bench or the alcove be chosen, it ought to be formed and finished in such a manner as to unite with the wood, the lawn, and the walk which surround it.

*Fences* become necessary where the place is large; yet the eye dislikes constraint, and a tall fence frequently hides the most pleasing objects. These considerations have brought the unseen fence into general use. This species of barrier, it must be allowed, necessarily involves a degree of deception, which can scarcely be warranted upon any other occasion. It is in this instance, however, a species of deceit which is often found in nature; how frequently have we seen two distinct herds feeding to appearance in the same extended meadow, until coming abruptly upon a deep sunk rivulet, or an unfordable river, we discovered the hidden barrier! Besides, the absolute necessity for fences where cattle ruminate, at once reconciles us to that which is the least obtrusive. It must be mentioned also, that sometimes a bold and high fence, particularly in this climate, is a pleasant object, from its usefulness in uncertain weather, and from the associations it thereby suggests at all times. There is another sort of fence meant to be hidden, besides that which is sunk. This is constructed of paling, painted of the invisible green. If the colour of the back ground were permanent, and that of the paint made exactly to correspond with it, the deception at a distance would be complete; but back grounds, in general, change with the season, and as regards either a fence, or its invisible character, such attempts are not altogether eligible.

In the selection and arrangement of the different materials of a landscape, the appearance of art should be concealed as much as possible; and in the more negligent scenes of nature, every thing ought to appear as if it had been done by its general laws, or had been the result of a series of fortuitous circumstances. Nevertheless, in the higher departments, art cannot entirely be hid; and therefore, when resorted to, the appearance of design ought not to be excluded. Yet art ought to be considered as

the handmaid, not as the mistress of nature; and it is equally improper when employed in carving a tree into the figure of an animal, or in shaping a view into the form of a picture.

Character is very reconcileable with beauty; and even when independent of it, has attracted so much regard as to occasion several vain attempts to produce it: statues, inscriptions, and even paintings, history, and mythology, and a variety of devices, have been introduced for this purpose. The heathen deities and heroes have had their several places assigned them in the woods and lawns of a garden; natural cascades have been disfigured with river gods, and columns erected merely to receive quotations. Another species of character arises from direct imitation. A scene, or an object which has been celebrated in description, or is familiar in idea, is sometimes represented in a garden. Artificial ruins, lakes, and rivers, fall under this denomination. But all the collateral circumstances which agree with a character, seldom meet in one subject; so that when brought together, though each be natural, the collection is artificial, and properly imitative. The art of gardening even aspires to more than imitation; it can create original characters, and give expressions to the several scenes, superior to any they can receive from allusions. Certain properties and certain dispositions of the objects of nature, are adapted to excite particular ideas and sensations. They require no discernment, examination, or discussion, but are obvious at a glance, and instantaneously distinguished by our feelings. Beauty alone is not so engaging as this species of character; it aims only at delighting the eye, but this affects our sensibility. An assemblage of the most elegant forms in the happiest situations, is to a degree indiscriminate, if they have not been selected and arranged with a design to produce certain impressions; an air of magnificence, or of simplicity, of cheerfulness, tranquillity, or some other general character, ought to pervade the whole. Barrenness itself may be an acceptable circumstance in a spot dedicated to solitude and melancholy.

The power of such characters is not confined to the ideas which the objects immediately suggest; for these are connected with others, which insensibly lead to subjects far distant from the original thought. Even without the assistance of buildings and other adventitious circumstances, nature alone furnishes materials for scenes which may be adapted to almost every kind of expression. It suffices that the scenes of nature have a power to affect our imagination and our sensibility; for such is the constitution of the human mind, that if once it is agitated, the emotion spreads far beyond the occasion. Quitting the objects that first set our feelings on the wing, we may be led from point to point in our thoughts, widely differing in degree, but still corresponding in character, till we rise from familiar subjects up to the sublimest conceptions, and are wrapt in the contemplation of whatever is great or beautiful, which we see in nature, feel in man, or attribute to divinity.

In thus speaking in general terms of the selection and arrangement of the materials that may be united in an ornamented scene—for nature scarcely knows the thing mankind calls a *landscape*—the house or human residence must be allowed to be a principal object in the composition; and though the nature of the place ought not to be sacrificed to it, it ought to be considered as the centre of the system, and the rays of the art, like those of the sun, should grow fainter as they recede from it. The house itself being entirely a work of art, its immediate environs should be highly finished; but as the distance from it increases, the appearance of design should gradually diminish, until nature gains full possession of the scene. In general, the approach should be to the back front, which, in suitable situations, should be open to the pasture grounds; on the sides more highly ornamented, a well kept gravel may embrace the walls: to this the lawn and shrubbery succeed: next the grounds closely pastured, and lastly, the surrounding country, which ought not to be considered as out of the artist's reach; for his art consists not more in decorating particular spots, than in endeavouring to render the whole face of nature delightful.

Another reason for this mode of arrangement is, objects immediately under the eye are seen more distinctly than those at a distance, and ought to be such as are pleasing in the detail. The beauties of a flower can be discerned on a near view only; whilst at a distance a coppice-wood, and the most elegant arrangement of flowering shrubs, have the same effect. Further, the vegetable creation being subject to the animal, the shrub may be cropt, or the flower trodden down in its day of beauty. If, therefore, we wish to converse with nature in private, intruders must be kept off—the shrubbery be severed from the ground—yet not in such a manner as to drive away the pasturing stock from our sight. For this reason, the shaven lawn ought not to be too extensive, and the fence which incloses it should be such as will not interrupt the view; but whether it be seen or unseen, is a matter of no great import: its utility in protecting the shrubs and flowers—in preserving that neatness on the outside, which ought to correspond with the finishings and furniture within—render it of sufficient importance to become even a part of the requisite ornaments.

Such are some of the principles recognized in our day, as essential to be observed in the highest display of the ornamental gardening art, which, as has been said by a competent judge, is as superior to landscape painting, as a reality is to a representation.

## PRESERVATION OF POTATOES.

The following directions for the preservation of potatoes, communicated to the Society of Arts, in the last year, by Mr. Webster of Ipswich, and published in the last volume of their Transactions, are, we believe, new to a great portion of the public, whilst the method is, we consider, practical, and might be acted upon advantageously. By steeping potatoes for four or five days in ammoniacal water, or water containing one ounce of liquid ammonia to the pint, the vegetative principle is wholly destroyed, whilst the ammonia soon evaporates; and, as no further effect is produced, an attention to this is not only important when potatoes are exported, but for the use of sailors. If they are allowed to remain in this water for about three weeks, a perfect consolidation of the starch and fibre is effected, the watery particles are absorbed, in appearance they become tough and shrivelled, and, in boiling, the starch is firm, and the potato is possessed of a mealy flavour. The action of the ammonia is here merely mechanical, and the curative property might be used to advantage. The same effect is produced by suffering them to remain for the same time in salt and water, taking care afterwards to remove the saline particles, by well washing them; and this, the writer observes, might be used very advantageously for the conversion of refuse potatoes into food for pigs and cattle.

## DIRECTIONS FOR PRESERVING GOOSEBERRY AND CURRANT BUSHES FROM VERMIN.

By Mr. James Hart, Dublin.

*(From the Transactions of the Highland Society of Scotland).*

To prevent caterpillars from infesting gooseberry or currant bushes, I would recommend the following treatment:—I will suppose that you have them in rows in a plot by themselves. In the beginning of November, clear all the weeds from them, and give the ground a good coat of dung close to the stems of the bushes; then dig a trench one spade deep right down the middle of the rows, throwing the earth on each side over the dung, so that it may be covered one or two inches thick. In the end of March or beginning of April, fork up the whole with

a dung-fork, filling up the trench, and making the whole level, but do not rake it at this time. Be particular in laying on the dung as above, and in forking up the whole in spring, for I apprehend a good deal of the success of the plan depends on this. The time for forking up is just when the buds have fairly opened. The fruit is wonderfully improved by this treatment, and the caterpillar effectually prevented.

The spade should never be applied about the roots of gooseberry or currant bushes, there being nothing more injurious to them. A heavy coat of dung needs not be given every season; but trenching them with a little dung close upon the stem, and forking in the spring, must not be neglected, otherwise the caterpillar will appear. The dung that I have always used is that from old hotbeds.

There is not much danger of making the ground too rich about these plants, as their roots run near the surface, while they produce heavy crops every year, so that they exhaust all the earth within their reach, and therefore stand in need of manure and the free admission of air to their roots, in order to recruit them. A rich sandy loam appears to be the primitive soil of the gooseberry, for in such the caterpillar never attacks them.

In ground not exactly suited to its nature, the gooseberry bush would derive no benefit from the dung being laid about its roots, if the ground were not stirred in the spring. Mr. John Kyle, gardener at Blair-Drummond, in Perthshire, dunged his gooseberries in 1804, laying on the manure exactly in the same manner in which I do, but, from want of stirring up, he was not relieved from the caterpillar in the smallest degree, nor was there any perceptible difference in the size of the fruit. Whatever, then, may be the theory of the case, the practice is known to be highly beneficial.

## ON THE DISEASES OF CULTIVATED PLANTS.

As organized beings, plants are liable to many accidents and derangements of functions, which either prevent their growth, destroy their texture, or disappoint the hopes of the cultivator. Systematic writers have attempted to classify these diseases, and Professor Wildenow, especially, has given a very complete and methodical list, which, though exceptionable in point of nomenclature, may, with some modification, be advantageously adopted. He divides these diseases into external and internal. The external diseases are—*wounds*, *fractures*, *fissures*, *losing of sap*, *mildew*, *fungus*, *excrescences*, *scabs*, and *blight*. Trees and shrubs are liable to be wounded in consequence of external violence, as by rubbing against stones or posts, or against each other during high winds, or from the bite of cattle; and as these wounds are often injurious, by producing a loss of sap, or admitting frosty air to the internal, it is proper to attempt healing them when small, or to take off the affected part where the injury is too great to admit of being otherwise remedied. Small wounds are in general easily healed by being covered from the external air; first, with several rounds of bass-mat, and applying over this a coating of Forsyth's composition, to be afterwards described, or of bees'-wax softened by melting it, with a due proportion of some vegetable oil. When it is necessary to cut off the affected part, it is proper to cover the stump for some time in a similar manner. Trees and shrubs are broken and splintered during high winds or thunder storms, and often by too great a load of fruit. When this injury is not very extensive, and takes place in young plants or in the smaller branches, it may in general be remedied by placing the divided parts in contact, surrounding them with bags, and applying over all a cement of wax or clay. Injuries of this kind can be prevented only where they are likely to arise from too great a load, by propping up the overloaded branches.

Sometimes, in consequence of great heat and dryness of the atmosphere, or from the bark not increasing so fast as the wood (which constitutes the affection, commonly termed hide-bound), a fissure is produced—an accident which has the same consequence as an ordinary wound. It may be prevented by cutting longitudinally the bark in time, and when it takes place, the injury is to be treated as a wound or splinter. Several trees, especially the birch, oak, cherry, and some other fruit trees, are subject to an overflowing of sap, which makes its way through some external orifice. In the first two the discharge is watery; and, in the last description of trees, it hardens into a gummy substance, resembling gum-arabic. When allowed to go too far it weakens the tree, and should, therefore, be checked by closing up the orifice with wax after removing the exuded matter. Mildew consists in a whitish powdery appearance on the leaves of certain plants, especially those of the peach-tree, and is supposed to be produced by the accumulation of small fungi, or the slime that is left by the plant-lice, and seems to arise from weakness. It is best prevented by washing the trees and plants during winter, with water thrown forcibly upon them by means of the garden-engine. When this disease has commenced, the affected leaves must be removed and destroyed, to guard against the infection spreading. A similar affection, also produced by the accumulation of small fungus vegetables or lichens, is often seen upon the bark of old trees, or even young ones in a weak state. It is not easily prevented, but may be removed by scrubbing the trunks with a brush and soap and water, and afterwards by anointing them with a liquid formed by boiling two pounds of soft soap, the same quantity of leaf-tobacco and flowers of sulphur, and four ounces of nux vomica, in eight gallons of soft water, till it is reduced to six gallons, adding, when cold, a gill of oil of turpentine. Various excrescences are frequently produced on the trunks, branches, or leaves of trees and shrubs, especially the oak, the currant-bush, and the rose-bush. They generally originate from the attacks of insects, and are seldom injurious excepting when a great proportion of the leaves is affected. They are not easily prevented, but when they become so large as to render the tree unsightly, they should be cut off; the wounded parts should be anointed with the above described saponaceous liquid, and the affected leaves removed. The scab commonly affects the branches of trees in the month of August, in appearance resembling the drop of a spermaceti candle, and most easily observed after rain when the bark is wet. It is a collection of very minute eggs of an insect, the species not known, covered by a very thin pellicle. The larvæ appear at the blossoming season, destroy the flower, and as they grow stronger, attack the leaves or even the young shoots. They are best removed by the finger nail, or their evolution may be prevented by covering the branches with a coating of clay in dry weather, of the consistence of thick paint. Blight in garden plants is different from the disease of corn so called, and consists in the shrivellings and often death of the tender leaves, shoots, and flowers, that make their appearance prematurely in early spring. It is caused by keen easterly winds or frosty fogs, and not by insects, as some suppose, though these animals often take up their residence in the blighted leaves. It can be prevented only by defending the trees.

Forsyth's composition or cement, above spoken of, and now so much employed by gardeners in cases of external injury sustained by trees, especially fruit-trees, is thus prepared:—Half a bushel of lime rubbish from old buildings, and the same quantity of wood ashes, each reduced to a fine powder, with one-sixteenth of a bushel of pit or river sand, are to be well mixed with one bushel of fresh cow-dung, washing and beating them together till the whole is as smooth as plasterer's mortar. Then chamber-lye and soap-suds are to be gradually added, till the mortar is reduced to such a consistency that it can be applied by means of a painter's brush.

Among the internal diseases of plants, Wildenow reckons ulceration and gangrene; and it is true, that though these affections appear externally, they may be aggravated by internal causes. Wounds or similar injuries may degenerate into ulcers, if not early covered from external air; and these ulcers, if left to themselves, commonly spread and discharge an ichorous matter, which corrodes and destroys the neighbouring parts.

Ulcers may be produced by insects or other unknown causes, and most frequently take place in the bark or external wood of trees, and in the surface of bulbous roots. In the former case the ulcerated part must be carefully cut out, and the wound covered with Forsyth's cement; in the latter, the roots must be taken up and dried before the diseased parts are cut away. When any part of a plant, as the flowers, leaves, or roots, become soft and moist, and seems to melt down into a foul ichorous matter, it is said to be affected with gangrene, which may arise either from external injury, destroying the life of the part, or from being situated in ground that is too wet or too rich. It can be cured only by removing the affected parts. Another disease, which consists in the death of particular parts, has been called *dry gangrene*, which differs from the former in its appearances. It usually attacks the leaves and tender shoots, causing them to grow black and dry, and is generally produced by severe frost or extreme heat; it appears similar to what has been called blight. Other internal diseases of plants are *discoloration*, *dropsical swellings*, *wasting*, *canker*, and *sterility*. Plants growing in places which admit but little light, or which are exposed to impure air, as from fermenting dung, are apt to lose their fine green colour, and become white or yellow. These affections are best removed by a free admission of light and pure air, and perhaps their removal may be hastened by the use of water impregnated with nitrous acid. *Swellings* in particular parts of plants, especially in bulbous or tuberous roots, often take place in consequence of long continued rain, or too much watering. Wildenow considers this allied to dropsy. It is generally incurable, as it commonly terminates in soft gangrene. *Wasting* and stinted growth are generally the consequence of bad soil or want of water, though they may be produced by other diseases, as by insects attacking the roots, or too great loss of sap. They are more easily prevented than cured. *Canker* is a disease which commences at the extremities of the branches, and gradually proceeding to the trunk, kills the tree in two or three years. Fruit trees, especially those which bear early, and those trained against espalier rails, or as standards, and the more delicate or finer sorts of fruit, are most liable to be attacked. The causes disposing to it are said to be bad subsoil, as soils charged with iron or other metallic impregnations, and exudations of gum. The causes producing it are injudicious pruning, by leaving ragged wounds, and the attacks of insects, particularly the larva of the *tortrix wæberana*, observed by Mr. Spence, of Hull. To prevent the disease, if the subsoil be bad, the trees should be planted as near as possible to the surface. If the disease attack a particular kind of fruit in a garden, other varieties should be substituted by grafting. In pruning, the cuts should be smooth and clean, and care should be taken to cover any wound with the usual plaster, and to remove soft or diseased parts. When the disease proves inveterate, the method adopted by Mr. Knight, in the royal gardens at Kensington, of *heading down*, and thus procuring new branches, may be resorted to. *Sterility*, when plants produce no flowers, or when these flowers prove abortive of fruit, takes place from numerous causes—as unsuitable soil, too much sap, too little heat, or improper treatment. The first of these is a very common cause of sterility. When the sap is too abundant, wood is too slowly generated, and the tree shoots up too fast into twigs and leaves, and either does not flower at all, or the flowers fail. The best way of remedying this, is to bleed the tree, by deeply scarifying the bark, or even to remove a considerable portion of it. By this last method, commonly called *decortication*, many old trees which had become entirely sterile, or produced an insignificant quantity of fruit, have been rendered exceedingly prolific. Want of heat not unfrequently acts as a cause of sterility in exotics from warm climates. As respects, for example, many plants from the Cape of Good Hope, it requires some skill in giving them a greater degree of heat in winter than in summer. But by properly adjusting the heat to the season, the plants will certainly produce blossoms.

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*The British Wine-Maker, and Domestic Brewer.* By W. H. Roberts. Oliver and Boyd, Edinburgh; and Simpkin, Marshall, and Co. London.

THIS is a volume full to overflowing of useful information, gathered from many years' close observation and experience. A glance merely at the contents will satisfy any one, that the points treated of are of vast variety, and of great importance to every family. The first part contains instructions for the making of British wines, with the aid of an ingenious instrument called the Saccharometer. Here the number of fruits, the juice of which yield wholesome and palatable wines, are too numerous for us to set down, as are also the directions to be attended to in the manufacture of such domestic beverages. The second part of the volume is devoted to the art of making liqueurs, ratafias, cordials, shrubs, and compounds, by distillation, infusion, and digestion; and the third part, to a short and simplified treatise on domestic brewing. We must declare of the whole, that for precision, simplicity, plainness, and comprehensiveness, the treatise is unrivalled, as regards the subjects discussed.

Before, however, presenting specimens of the abundant and accurate information to be found—such indeed as every gardener, farmer, and cottager, should be possessed of, or rather every one who can command the use of garden fruits—it is necessary that we should endeavour to impress upon our readers two points, that are clearly and strongly established by the author.

There is a general prejudice entertained against home-made wines, which, no doubt, is partly attributable to the improper and inferior manner in which they are manufactured, and partly to the fancy, that whatever comes from abroad, and is expensive, must be better than that over which there is nothing that can afford scope for fancy and mystery. But our author states, and indeed by reference to incontestable facts, shews, that not only is more than one half of the wine, called foreign, made up in this country, or adulterated, but that our home-made wines, if properly managed, are more healthful and exhilarating than the drinks common among the middle classes in this country, and than much of the wine that is imported from abroad. He admits, that none of our fruits (grapes excepted) are calculated to produce such perfect wines as those grown in a warmer climate; and that even from our grapes, although such wine may be perfect, it will be without that aroma which characterises some of the French wines. But he argues fairly, that a perfect, wholesome, and delicious wine, may be had from our common garden fruits, at four or five hundred per cent. under the price of the miscalled "Good Genuine Port or Sherry," or eight hundred per cent. under the price of the "Delicious Clarets and Champagnes," that are very much in our market. He mentions that he has in his cellar at present, thirteen different kinds of wine, all of his own making, being twelve years old. This proves their durability: and he adds, that in his estimation and that of others, they will go on improving for many years to come. He laments that neither government, nor any public Society, the Caledonian Horticultural Society excepted, have ever sought to encourage the manufacture in which he seems to be so fully skilled; and we fear, that however zealous amateur home-made wine-makers may be, nothing like any considerable progress or fame will be attained in this branch. But as it is clearly well adapted to domestic opportunities, and as it is eminently of that kind that will present more of the character of an interesting pastime than of toil, we doubt not that it will, ere long, and especially in consequence of the highly satisfactory information herein contained, become a fire-side manufacture in many a family, who hitherto have been strangers to its value, or prejudiced against its use, owing to their ignorance of its capabilities. How seldom have home-made wine manufacturers applied that instrument which our author considers indispensable in this operation! Its value and extensive merits may be judged of from the following passage:—

"One of the objects of this treatise, is to lay down a simple

method to guide the operator in judging of the value of his fruit, as well as of his sugar, before and after fermentation; to enable him to conduct the process with comparative ease and satisfaction to himself, and to secure a favourable result. The chief object he has in view, is to convert the sugar of the fruit and the sugar employed, into spirit, which he will be enabled to do, as far as is possible in so small a body. The nature of this conversion, and the circumstances attending it, form one of the most obscure departments of chemistry. That this decomposition, namely, the converting of the saccharine matter into spirit, is going on, can only be ascertained by the saccharometer, which will shew the gradual or rapid progress of the attenuation through fermentation. This instrument also shews the specific gravity both of the pure juice, and the juice and water, as well as of the compound of juice, water, and sugar. To accomplish this end, portions of the *must* or compound must be taken out daily to be weighed by the instrument. I would strongly recommend those of my readers who are wine-makers, and who are really desirous to excel in this art, to record the results of their daily examinations in a book kept for the purpose, that they may serve as guides to them in their future operations. It must be obvious to every reflecting mind, that without a knowledge of the fermentable matter one has to work upon, all attempts to obtain uniformity of wine must be unavailing. As I must of necessity give a description of the saccharometer, with the mode of using it, I shall, at present, confine myself to a short sketch of this instrument, with the indications, and their results.

" The saccharometer is an egg-shaped ball, balanced below, and terminating above in a triangular stem; on each side of which there are cut ten divisions. The sides are distinguished by the letters A, B, and C. A tin-plate cylinder for holding the liquids accompanies it. When the cylinder is filled with pure water at the temperature of 60 deg., and the saccharometer put into it, the instrument sinks until the whole of the graduated stem is below the surface. When the saccharometer is put into the syrup or juice, or into the compound, it does not sink so low, because these liquids are heavier than water; and as their weight increases with their strength, it is obvious, that the stronger the compound is into which the saccharometer is put, the less it will sink. The cut divisions on the stem of the instrument indicate the specific gravity of the liquid under examination, or, which is the same thing, the excess of its weight above the same bulk of water. The weight of water always being represented by 1000, as a cubic foot of water weighs 1000 ounces or nearly so, at 60 deg. of temperature; therefore, any number on the instrument which the surface of the liquid cuts, shews that that liquid is that number of ounces heavier than water.

" I have used this instrument upwards of twelve years, without the aid of which I have never made wine of any description. I use it, first, for finding the specific gravity of pure juice; secondly, of the pure juice with water; and, thirdly, of the compound of juice, water, and sugar, bringing the *must* up to the intended standard. Thus, having a compass to steer by, I add to or decrease the quantity of sugar or pure juice necessary for compounding every year a *must* of the same quality."

We now present some extracts that will at once shew how familiar our author is with the matter of which he treats, and at the same time afford instruction, we believe, to every reader. There is a very full and satisfactory account of the manufacture of Champagne from unripe gooseberries, which is more frequently made from our domestic fruit than any other kind, because it can be produced more nearly perfect, so much so indeed, that such wines pass very often for a foreign manufacture. The mode of proceeding before casking—at casking—the French method of managing their wine of this name, in the different stages of fermentation, racking, and bottling—are all explicitly and clearly detailed. We can only find room for some particulars in the first stages of the operation, as respects the juice of unripe gooseberries.

" One of the best methods of manufacturing this wine which I have found, I will be very particular in describing. At the commencement I use only one part of water and three of berries. An imperial gallon of fruit, when heaped, weighs 10 lbs., it may be less. To avoid unnecessary calculation, it may be as well to assume, that an English pint of fruit will weigh 1 lb., as well as an English pint of water; really an English pint of water weighs upwards of $1\frac{1}{4}$ lb., but this difference is of little consequence, as it is by measure and not by weight we proportion the fruit and water. To make a fifteen gallon cask of wine, you will require $22\frac{1}{2}$ gallons of gooseberries, as the fruit does not produce much above one-third juice; the $22\frac{1}{2}$ gallons of fruit consequently will only produce $7\frac{1}{2}$ gallons of juice. It is always advisable to make a two gallon cask more, for the purpose of supplying the deficiency which will necessarily arise from racking off the large cask, so that, instead of filtering the grounds from the large cask, and returning them into it, you will fill it up with fine wine from the small cask; afterwards filter the grounds, and fill up the small cask with them. These additional two gallons will require extra fruit in proportion. This method of employing two casks I would strongly recommend, both for this wine and for every other. The water and the berries are not all to be mixed up at once; three tubs are to be employed on this occasion, one for the berries, a second to bruise them in, a third to receive them when they are bruised. One gallon of the berries is to be bruised at a time, in order that every berry may be broken, which can only be accomplished when done in this manner, but would be almost impracticable were all the $22\frac{1}{2}$ gallons together. Those bruised are to be removed to the third tub, and one-third of a gallon of water is to be added, and so on until the $22\frac{1}{2}$ gallons are bruised, *i. e.* after each gallon of bruised fruit one-third of a gallon of water is put to it, until the $22\frac{1}{2}$ gallons of bruised fruit are emptied into the third tub, and the $7\frac{1}{2}$ gallons of water are added. This refers only to the making of fifteen gallons, not the fifteen and the two gallons. The mass is then to be well mixed, a portion of the liquor to be taken out for examination by the saccharometer, and the specific gravity noted in a book for the purpose, which it is probable will be from 17 to 18 on the instrument: the tub to be then covered up. The next morning the mass is again to be well agitated with a stick, and a second examination noted. The gravity will not appear to have increased much, but as long as it does increase, the liquor must remain on the husks, as fermentation has not yet commenced. There is no certain time you can say that this will begin, sometimes in ten hours, and sometimes not until three days. The instrument is the only sure guide, for as soon as you perceive a decrease in gravity, you may rest assured fermentation has commenced. The husks must then be removed, after having been well pressed with the hand, and the liquor strained; but as they still contain some good, two or three gallons of water are to be poured on them; they may be again squeezed and strained, and this second liquor added to the former, which should not be less than 20 gallons, if the 15 and the 2 gallon casks are to be filled. The second tub, which was employed for bruising, is to be washed, the whole liquor measured into it; the gravity is again to be found, for the purpose of ascertaining how much sugar will be necessary to raise the *must* to the standard gravity. We shall suppose that the compound has now been reduced to 15 by the additional two gallons of water, and our standard gravity being 110, we require 95—and that must be made up by sugar. By mixing 1 lb. of good refined sugar in every gallon of the juice and water, an increase of gravity will be observed to the extent of 36 at the temperature of 60 deg. By adding a second pound to each gallon, a farther increase of 36 will be observed, making 72, being still deficient 23: $\frac{5}{8}$ lb. more will be required, which will make an increase of $22\frac{1}{2}$, and which will bring the *must* up to $109\frac{1}{2}$. I have been in the habit of using, instead of $2\frac{5}{8}$ lbs. of sugar to each gallon, $2\frac{1}{2}$ lbs. of sugar, and $\frac{1}{4}$ lb. of virgin honey. The honey must be boiled with the same weight of water for fifteen minutes, and well skimmed during that period. This plan is a little more expensive, and besides

the excess of gravity, will not be so much as the same weight of sugar; but the honey adds to the wine a soft and mellow flavour, which makes it more resemble the real Champagne. The whole being put together, and thoroughly agitated, for the purpose of melting the sugar and honey, we must cover up the tub with a blanket; and this agitating during the first day must be repeated every two hours. After the last agitating, a portion must be taken out and examined by the instrument, and recorded. Every morning and evening, this operation of agitating and examining must take place, until the gravity has been reduced to 80. It is then to be strained through a fine sieve, and put into the casks, one of fifteen gallons, the other of two, and the remainder, which may amount to half a gallon, or a little more, kept to fill up the casks, which, for the first three days, must be done every three hours; a dish having been previously put under each cask to receive the scum the wine throws out during fermentation. The fine of it is not to be thrown away, but kept for the purpose of assisting to fill up the casks. A sample of the wine must be taken out every third day, for examination by the saccharometer."

We pass over the account of how wine is to be made from ripe gooseberries, from ripe and unripe grapes, to that which may be extracted from the leaves and cuttings of the grape vine; for it would almost appear, from the multitude and variety of objects in the vegetable world, that yield a delicious juice under skilful management, that we live in a land not only flowing with milk and honey, but with generous wine.

"Wine made from the leaves of the grape, as well as from the cuttings of the vine, is highly prized, and does not appear so decidedly a domestic wine, as most of those made in this country, resembling in flavour more the foreign wine. The cuttings seem best calculated for making this wine. The best time for using them, is at the second cutting of the vine, when they are to be carefully collected, and put into a large tub; should there not be a sufficient quantity of cuttings, the deficiency may be made up with leaves; they must be closely pressed in the tub, and as much boiling water poured upon them as will cover them. When the heat is reduced to 60 degrees, it is advisable to take a sample for examination by the saccharometer. The whole is to be allowed to remain in the tub for several days, frequently stirring it. The original gravity will be low, and when by the saccharometer it is found to be decreasing (which will not be for a few days), the liquor is to be strained off from the cuttings, squeezing the latter. A gallon or two of boiling water again put upon the cuttings, and allowed to remain until the heat has fallen to 80 or 90; when the liquor is to be strained off (squeezing again the cuttings), and added to the former quantity. The whole now to be measured and weighed, and the deficiency of gravity made up by adding sugar, either moist or lump, as the operator chooses, until the standard 120 is obtained. If the fermentation appears languid, it is advisable to take out a quart of the liquor, warm it to 90, and break into it a wine glassful of good brewers' yeast, until it is found to have increased its bulk one-half; when it is added to the whole liquor or *must*, mixing it well up, when there is little fear fermentation will be vigorous. The after management to be exactly the same as in the wine made from the unripe grapes, quoted from Dr. Macculloch."

Raisins, currants, parsnips, and many other fruits, are the source of exhilarating and delicious beverages. In treating of liqueurs it is fairly confessed by the author, that it is no more possible in this country to give them the highly delicate flavour of tropical regions, than it is to do so with our preserves. At the same time, very fine liqueurs, shrubs, and cordials may be produced, even in our climate, by care and going into the necessary expense. By distillation, various aromatic waters and spirits, as well as the choicest liqueurs, may be produced. The vile adulterations practised by many persons that deal in these articles may be thus avoided. By infusion, which is the art of putting into a liquid some substances which are naturally dry, and of allowing them to remain for a time, the most agreeable liqueurs can be obtained.

"RATAFIAS.

"The method of composing the common liqueurs by infusion and not by distillation, is unquestionably the most ancient; although extremely simple, it possesses many advantages; the expense is seldom considerable, and the care it requires comparatively little. By attention the artist may obtain liqueurs not only passable, but delicious. Make your infusions only in stone jars; above all, take care not to use any metal vessel, for example, of copper, pewter, or even of white iron. 2d. Employ only the finest brandy or rectified spirits. 3d. It is no less important to make a good selection of the ingredients, as well as of the fruits and flowers, which are to enter into your composition. Let your spices be fresh, and abounding with essential oil; the grains and seed new, and seasonably dried; the fruits should be very ripe, without being too much so: the flowers fragrant, always gathered in a fine season, and shortly after sunrise: in short, take care that nothing tastes mouldy, for wherever this disagreeable flavour exists, it is not possible to remedy it. 4th. The time of the infusion should be from six weeks to two months. The choice of the place is not indifferent. In summer, if possible, place your jars where they will have the influence of the sun, and in a temperate place during the winter; being careful to keep them tightly closed down, to prevent evaporation. 5th. If you can employ spirits of wine well rectified, instead of brandy, your liqueurs will be much finer. There are even cases where spirits of wine must be employed. When you wish to make ratafias with fruits which give much water, should you not be careful to remedy this evil, by means of a stronger spirit, they will be constantly too weak, and almost without flavour. Infusions require a very great deal of attention in filtering. In the first place, in the choice of the filter, that it may not be too thick, and by this means either prevent the liquor passing through altogether, or, by causing it to pass through too slowly, and allow the spirit to evaporate. Next, that it may not be too thin, and by allowing it to run through rapidly, will prevent its being clear. A cloth rather porous ought to be used for the first filtration, to keep back the grosser sediment; then one rather less porous; and, thirdly, it should pass through filtering paper until it is perfectly clear."

The following are receipts for making three kinds of ratafias—

"IMPERIAL RATAFIA.

"*To make two Gallons.*

"Take two ounces of the kernels of peaches, apricots, and nectarines, bruised; five ounces of bitter almonds bruised; half a pint of the best rectified spirits of wine (English measure), in which dissolve half a drachm of compound essence of ambergris; five quarts of malt spirits, one in five; half a gallon of English Frontiniac wine, and as much rose-water as will make up the two gallons: steep the kernels and the almonds for ten days; then draw off for use. This quantity will take one pound of loaf sugar to sweeten it; one pound and a half may be employed, if required sweet. It will greatly improve the look of it, if it be filtered.

"RECEIPT FOR MAKING RED RATAFIA.

"Take cherries and gooseberries, of each thirty pounds; mulberries, seven pounds; and raspberries, ten pounds. Pick all these fruits clean from their stalks, &c., bruise them, and let them stand twelve hours; but do not suffer them to ferment. Press out the juice, and to every pint add three ounces of sugar: when the sugar is dissolved, run it through the filtering bag, and to every five pints of liquor add four pints of clean proof-spirits, together with the same proportion of spirit, drawn from the spices in the foregoing composition.

"But it may not be amiss to observe here, that different persons use different quantities of spirit drawn from spices. The best method, therefore, is to imitate the flavour most generally

approved, which may be easily done, by adding a greater or less proportion of the spiced spirits.

" FINE RED RATAFIA.

" Mash together, in a tub or pan, three pounds of black cherries, two of ripe red gooseberries, and one of raspberries; mix with these, twenty-four cherry kernels, previously pounded in a mortar, with a pint of syrup; put all into a jar; stop it close, and keep it for twelve hours in a heat of about 90 degrees of Fahrenheit's thermometer; press it through a clean napkin; let it stand twelve hours longer, and then add to each quart of the juice a pint of good brandy; next day strain it through a flannel-bag till it is quite clear.

" *Obs.*—The French liqueurs are in general very badly imitated in England, from our substituting bitter almonds for peach and apricot kernels, and common proof spirits for their fine Cognac brandy."

Without touching on the Treatise on Brewing, which art our author has been engaged in for the greater part of his life, these extracts will shew that this small volume contains a mass of practical information, which no family should be without; for nothing is better known than that the works generally hitherto published on the matters treated of by Mr. Roberts, are either merely theories, or attempts, conducted without any regard to science. But here we have a knowledge of sound principles and the fullest experience, joined with unwearied zeal. So that hereafter, if any family be without wholesome and delicate wines and cordials, it will be owing to their carelessness and want of taste for an interesting and beautiful occupation. We can assure our readers, that in this little volume there is to be found a vast deal more than is to be expected from its title.

## BEDFORDSHIRE.

This inland English county is situated nearly in the centre of the island. It is bounded, on the north by Huntingdonshire, on the west by Buckinghamshire, on the south by that county and Hertfordshire, and on the east by the latter and Cambridgeshire. Its greatest length is about thirty-six miles, and its greatest breadth about twenty-two. Its extent is 296,320 English statute miles. The civil division of the county is into nine hundreds, which contain nine market towns, and 124 parishes. The population in 1801 was 63,393, and in 1821 it had risen to 83,716.

As nearly the whole of Bedfordshire is situated on the eastern side of the grand ridge, which separates the waters which flow into the German Ocean, from those which find an outlet in the Irish Sea, its general inclination is towards the east, and the rivers, of course, chiefly flow in that direction. Much of the surface is varied with hills and vallies, though few of its eminences are of great height. Much of the surface of the county is composed of alluvial soils, principally consisting of yellow and dark coloured clays; which however are diversified with tracts of chalk and sand. The western, and some of the eastern parts are flat and sandy. The predominating soils are clay, sand, and chalk, variously mixed, producing loams of greater or less tenacity, according to the prevailing materials of which they are composed. Much of the county long remained uncultivated; but the flourishing period of agriculture, within the last quarter of a century, has left few large patches in a natural state. It is merely an agricultural county, and as four-fifths of the land are devoted to pasture or to the dairy, and not above one-fifth to tillage, the increased number of the inhabitants has caused a scarcity of employment, and a consequent advance in the poor rates. The chief occupation of the manufacturing kind consists in plaiting straw and forming it into chip hats, making baskets, and other articles; females are almost the only manufacturers. Some trade is carried on by the rivers, and the Grand Junction Canal, by which corn and butter are conveyed to distant markets and the inhabitants supplied with fuel. No county is better accomodated with good roads, chiefly owing to the exertions of the late Mr. Whitbread.

There is a great scarcity of wood in Bedfordshire, though of late years, plantations to a considerable extent have increased. The gardeners of Sandy and Girtford have long been celebrated in this county, and those adjacent, for the excellence and abundance of their culinary vegetables. But it does not appear that any particular process is employed, which is not known to all professional gardeners. London is the great market for this produce of the soil, as also for the butter that is extensively made in the county. Yet the farmers here are not celebrated for rearing any peculiar or excellent breed of cattle. Indeed, as respects agriculture in any of its branches, Bedfordshire is neither famed for caprice nor ingenuity: the farmers generally follow out such popular opinions on the minor subjects of the art, as have been practised for a length of time. The principal improvements which have for many years taken place, have almost all originated with Francis, late Duke of Bedford. But as we are not aware of any singular or highly distinguished feature in the husbandry and rural economy of this county, we shall confine ourselves, in what is to follow, to giving an account of an interesting discovery in the history of drainage, which was a number of years ago made in Bedfordshire.

A modern alluvium covers all the flat and lowest parts of the large vales of the county, within the reach of rivers and brooks when swollen by floods, and which continues to accumulate by slow degrees from the sediment of the flood waters which overflow these flats, or tracts of meadow soil, as the hazle-loam peculiar to these situations is often called. Upon the gravel in the bottoms of the vales, in the sand district, peat has grown; and in most cases, where draining has not been affected, it is still increasing, aided by the ferruginous or ochreous sediment of the floods which cover them occasionally; but whence the sulphuric acid is derived, which abounds in great quantities in the sandy peat valleys of Bedfordshire, it is not easy to guess. As the peat of these vallies by decomposition become solid, and almost impervious to water, at their lower parts in particular, the springs, or soakage of the water, are collected, and make their way down the open floor of gravel, beneath the peat; and hence it happens, owing to the fall of the valley, and the superabundance of the supply from particular strata on which this gravel floor rests, that the gravel becomes charged with a column of water, which the decomposed and solid peat prevents from rising direct into the brook and escaping, and the same therefore makes its way up the gravel floor, to the edge of the peat, where it is principally discharged to the surface of the peat; a circumstance that has contributed to its faster accumulation at the edges, and, in many instances, causes it to be higher by several feet along one or each side of the valley, than along the centre, or brook course. Appearances like these, of peat but moderately wet along the middle and lower line of a boggy vale, yet with water oozing through every pore of its sides, and even flowing over its higher edge, naturally enough suggested to the late Mr. Elkington, when employed at Crawley Bog, on the Woburn brook, and at Prisley Bog, on the Ivell, that the source of water which occasioned the bog, was from the adjoining hills; and accordingly, he set out great lengths of drains along the skirts of Crawley Bog, which were executed by his foreman, who had worked in draining under Mr. Elkington in different counties. In undertaking, soon after this, to drain the bog at Prisley, under the inspection of a Committee of the Board of Agriculture, whose certificate of success was to be Mr. Elkington's title to a remuneration from Parliament, for his supposed discoveries of the sources of springs, and their infallible cure by draining,—Mr. Elkington unfortunately made herea gain the mistake which has been hinted at above; and in presence of the Committee, staked out a line on the south-east of Prisley Farm-house for the open drain, which was to do the business, and prescribed the exact width at top and at bottom, and its depth in various parts; which particulars being committed to

writing on the spot, the Duke of Bedford, at whose expense the whole of the experiment was made, in presence of Mr. Elkington and the Committee, handed their written directions to his agent, Mr. Farey, who was present, and directed him to hire and superintend the cutting of the drain which had been staked out, in all respects conformable to Mr. Elkington's written detail. This was accordingly done with the most scrupulous exactness, in the course of some weeks, immediately after the arrangement was thus concluded.

In the progress of cutting this drain, Mr. Farey discovered that the deep open cut which was making, being for the most part in alluvial clay, or in gravel with almost no water, collected little of course, although the water was oozing out of every pore of the bog, within a few feet of the lower edge. These circumstances induced him to examine this and other neighbouring valley bogs with attention, and led to the discovery of their true nature, as above explained. It may be stated in confirmation, that after the total failure of Mr. Elkington's first drain at Prisley already mentioned, and of the numerous extensions and branches cut from it by Mr. Elkington's foreman, and under his own uncontrolled directions, that these principles being made known to his Grace by Mr. Farey, directions were given to apply them in the drainage of Crawley Bog, which was soon completely effected, merely by one open drain, up the lowest parts of the valley and bog, and the deepest of the peat, which however was cut through, and the gravel reached in most parts of the drain. The effect of this was, that the gravel floor of the peat, with the same facility conveyed such springs as really issued out of the strata at the edges of the peat, down to the central drain, as it had before given passage to the pent column of water in the open gravel there, to flow up and over the edges of the peat, as has been explained. The same principles were attended to in other places with equal success, and shortly after Mr. Farey affected a still larger drainage by the same simple means, under the Commissioners for the inclosure of Mulden, and at the general expense of the proprietors; the works recommended by Mr. Farey being such only as the Commissioners judged necessary to be performed, at the public drains and brooks of the parish, under the usual clauses for their improvement at the time of an inclosure. The above details on the principles and practice of draining are of great importance to all who would obtain a mastery over valley bogs.

## ON THE CULTURE OF STRAWBERRIES.

It has been remarked by Mr. Knight, that there is a great mistake in the prevalent custom of planting strawberries in the month of August. But the spring is the only proper season for this operation. At that season the ground, having been properly worked and manured, will long continue light and permeable to the roots, which will consequently descend during the summer deeply into the soil. Abundant foliage will be produced, and fully exposed during summer to the light; much true sap will be generated, and comparatively very little will be expended; for if any fruit stalks appear, it is necessary to take them off. In the following season a superior crop will be produced than by plants of greater age or differently treated. Whereas those planted in August acquire sufficient strength before winter to afford a moderate crop of fruit in the following year; yet they will not have formed a sufficient reservoir of true sap to feed even such a crop, without being impoverished. Nor will the aggregate produce in two seasons generally be found equal in quantity or flavour to that afforded in one season by a plantation of equal extent made in the spring.

## EARLY AND RIPE VARIETIES OF THE PEAR ON SAME TREE.

In Scotland it is a practice to grow several varieties of pears on the same tree, against a wall. The climate so far north, requires many of the pear trees to be trained on warm exposures. But in England, in private gardens, the practice is worthy of imitation. Variety is thus obtained, without the waste that often attends the crop of a full sized and well managed pear tree. The plan particularly recommended in the north is, to graft the half of the late pear trees with the early sorts, and half the early trees with the late sorts:—thus every alternate branch of the Crassane with the Jargonelle, and the Jargonelle with one of the best late sorts. There are thus two chances of success. The crop coming at different periods, the early sort may be ripened off before great effort has been required for the support of the other, which is also a material consideration. The various advantages of this economical plan require only to be named to be perceived. Its success is beyond a question.

## DESCRIPTION OF THE PLATES.

### RANUNCULUS ASIATICUS var. CARA.

CARA RANUNCULUS.

Polyandria Polygynia.

Ranunculaceæ.

Leaves biternate, leaflets pinnatifid, deeply divided, segments numerous, linear, acute, and terminated with hairs. Flower stalk a foot high, clothed with leaves and densely woolly. Flower consisting of several circles of very handsome formed petals, which are curved a little inwards; they are white, tinged with straw colour, and edged with bright red, that extends down the centre of each petal.

From the great diversity in the colour of their flowers, and also in the form of their leaves, the ranunculus may be considered as one of the most interesting, if not the most valuable of florist's flowers.

The varieties produced of late years from the seeds of semi-double flowers, are unbounded. Maddock, in the end of last century, had nearly 800, all with proper names, and ranged as purple, grey, crimson, red, rosy, orange, yellow, white, olive, coffee, striped, spotted, &c. No plant is more prolific in new varieties from seeds: no two plants, as Maddock observes, producing flowers alike, or the same as the original. Established sorts are propagated by offsets, which generally flower the first year: rare sorts may be multiplied by dividing the crown of the tuber with a sharp pen-knife into as many parts as their buds: these will not flower till the second year, but will diminish the risk of losing a very rare variety.

We are obliged to Mr. Groom, florist, Walworth, for the specimen of this pretty variety, whence our drawing was taken.

### CROCUS SEROTINUS.

LATE FLOWERED CROCUS.

Triandria Monogynia.

Irideæ.

Bulb-tuber larger and flatter in the cultivated than in the spontaneous plant, yet twice smaller than the *sativa*; root-sheaths somewhat tawney; corolla of a faint violet purple; stigmas of a bright orange colour, *leaves* 3-7.

It is a very rare plant, and in a mild season is a great ornament to our gardens, flowering close under a south wall till the beginning of December.

From all the varieties of blue spring crocus, it may be immediately distinguished by having two bracteas under the pericarpium, and scarcely any beard at the base of the limb.

Increased by offsets from the bulbs, or by seeds.

### PAPAVER RHŒAS.

RED POPPY.

Polyandria Monogynia.

Papaveraceæ.

Stem herbaceous, upright, branched at top; a foot or more in height, and clothed, as well as the flower stalks, with strong hairs which spread horizontally; leaves sessile, pinnate, or bi-pinnatifid, serrated, and covered with short hairs. Flowers large, solitary, standing on long hairy foot stalks, the calyx consists of two ovate, hairy, concave leaves, which fall before the flower expands; the petals are four, large roundish, un-

1. Crocus serotinus.

2. Papaver.

3. Ranunculus Asiaticus var. carus.

1. Dianthus Chinensis.

5. Cypripedium Calceolus.

6. Ipomœa repanda.

7. Daphne colliva.

8. Saxifraga oppositifolia.

9. Linum usitatissimum.

10. Grislea tomentosa.

dulated, of a deep rich scarlet colour, and generally marked with a black spot at the base. The germen, which becomes a smooth, urn-shaped capsule, is ovate and large, without any style. Stigma sessile, shield-shaped, scolloped on the edges, and having 10 or 12 rays. Capsule crowned with the stigma, divided into many cells, each containing numerous kidney-shaped seeds.

The flowers of the red poppy possess a faint narcotic odour, and are generally thought to have a slightly sedative effect. They yield their virtues to boiling water, but are merely used for their fine colouring matter.

It is an indigenous annual, growing plentifully in corn-fields, where it frequently proves a very troublesome weed; flowering in June and July. Like most other pretty flowers, the red poppy has been celebrated by poets in different ways; thus from their flowering among the corn, they have been supposed, by one, to be upon the look out for Ceres:—

"And the poppies red,
On their wistful bed,
Turn up their dark blue eyes for thee."

In a later poem by Mr. Laudor, Ceres is supposed to have created the poppy, to assuage her anguish during the search for her daughter; and the statues of the Goddess were generally adorned with the flowers, from their being companions of wheat; propagated readily by seeds sown in common soil.

## DIANTHUS CHINENSIS.

CHINA PINK.

Decandria Digynia.

Caryophylleæ.

The flower stems of the *China pink* are from six to eight or nine inches high, branching out on every side; the branches grow erect, and are terminated each by one flower. Petals five, crenate.

Though it cannot boast the agreeable scent of many of its congeners, it eclipses most of them in the brilliancy of its colours; there are few flowers, indeed, which can boast that richness and variety found among the most improved varieties of this species; some being as full of petals as the best double pinks, and displaying the most glowing and vivid red colours; and as these are easily obtained from seed, so they are found in most collections, both single and double; where they prove a considerable ornament, from July until autumn frosts put a stop to them.

This species, unknown to the older botanists, is a native of China, hence its name of China pink; but, in the nurseries, it is in general better known by the name of Indian pink. It is little better than an annual, but will sometimes continue two years in a dry soil, which it affects.

As these plants do not grow large, so, when they are planted singly in the borders of the flower garden, they do not make so fine an appearance as where they are planted by themselves in beds; the flowers, being of different colours, set off each other to advantage.

Those who are curious in these flowers, take particular care in saving their seeds, for they never permit any single flowers to stand among their double, but pull them up as soon as they shew their flowers, and also draw out all those which are not of lively good colours; where this is observed, the flowers may be kept in great perfection.

The seeds should be sown upon a gentle hot-bed in the beginning of April; when the plants come up, they must have a large share of air admitted to them to prevent their drawing up weak; in about three weeks after, they will be fit to remove, and planted in a bed of rich earth, at about three inches asunder, being careful to shade them from the sun till they have taken new root, and in dry weather water three or four times a week.

## CRYPIPEDIUM CALCEOLUS.

COMMON LADIES' SLIPPER.

Gynandria Diandria.

Orchideæ.

Root composed of many fleshy black fibres, spreading obliquely near the surface; the fleshy part retaining the mark of the stalk produced the former year; a new root being annually formed on the side of the old one. Stalks, two, three, or more, in proportion to the strength of the root; nine, ten, or twelve inches high, and a little hairy. Leaves from three to near four inches long, and near two inches broad at their base, of a deep green, and ending in acute points. Four or five of these leaves are placed alternately along the stalk. In the bosom of the upper leaf is inclosed the flower-buds, supported by a slender peduncle, which generally turns a little on one side, and, before the flower opens, advances above the sheath. The corolla has four narrow petals, of a dark purple colour, placed in form of a cross, and spreading wide open. In the centre is situated the nectary, shaped like a wooden shoe, of a pale yellow colour, with a few broken streaks; the opening is covered with two ears; the upper one tender, white, and spotted with purple; the lower thick, and of an herbaceous colour.

If the beauty or scarcity of a plant, or the singularity of its structure, entitle it to our notice, the ladies' slipper certainly merits the first place in every collection of British plants. It may, indeed, be reckoned the *Queen* of all European orchideæ. Accordingly, it has not only been admired and cherished by the scientific botanist, but it has, among gardeners, always been sold at the highest price of any British vegetable.

It is confined to some remote and little frequented woods in the north of England. In a garden this plant is cultivated with more ease than many of its tribe, thriving well in a shady border in peat soil; or, if planted in a pot, and set under a hedge, where it has the morning sun only, it will last many years.

The roots will spread so as to fill the pot, and the plant may be propagated by parting the roots, but it must be done with caution.

## IPOMŒA REPANDA.

SCOLLOPED IPOMŒA.

Pentandria Monogynia.

Convolvulaceæ.

Stem ash-colour with a brown and purplish tinge, round, smooth, fleshy. Leaves somewhat fleshy; petiole tinged with purple when exposed to the sun; lamina dull green, more glaucous underneath where the nerves are often tinged with purple, generally cordate, sometimes in luxuriant branches 3-lobed or 5-lobed, more or less repand, ending in a small point quite distinct from the margin, smooth on both surfaces. Flowers without smell, in short dichotomous axillary panicles. Peduncle smooth. Bracteas very small; calyx deep crimson with a paler and more glaucous hue near the edge. Leaflets unequal, round, attenuated towards the margin, embracing the tube very closely. Corolla shining crimson, about two inches long, thickish in substance; tube very short; limb scarcely funnel-shaped, its divisions more plicated and less expanded than in the other species. Filaments broad and hairy at the base, closing the orifice of the tube so completely that when the corolla falls, it pulls off the stigma by its weight. Capsule generally two-locular with two seeds in each cell, and four valves.

A native of Tobago, flowering from November to January. It has lately been introduced into our stoves, and well deserves more care than is usually bestowed upon this tribe of plants. The root is perennial, and every cutting of the plant will grow; but without the branches are permitted to extend a great length at the top of the house, they hardly ever produce their numerous and very elegant flowers.

## DAPHNE COLLINA.

HAIRY DAPHNE.

Octandria Monogynia.

Thymelææ.

Stems three feet high, much branched, the branches often forked; bark tough, wrinkled, void of down or hair, except on the younger branches. Leaves evergreen, alternate, on short foot-stalks, entire, a little revolute on the edge, having a silky

down underneath. Bracteas obovate, obtuse, externally downy. Calyx red, with a silky down on the outside; its divisions spreading a little obtuse. Germ clothed with upright bristles, and having nectariferous glands at the base.

Though not so splendid a shrub as many, it is a very desirable acquisition, on account of the earliness of its flowering and agreeable scent; its foliage also is ornamental, its upper surface being of a fine glossy green; the flowers, in point of colour, are not so brilliant as those of the common *Mezeron*, and soon change to a faded purple; before they expand they are covered with a fine silky down.

It flowers from January to April, is not difficult of culture, and is usually propagated by grafting it on the common *Mezeron*. It is best to treat it as a green-house plant; in mild winters it will bear to stand abroad.

## SAXIFRAGA OPPOSITIFOLIA.

OPPOSITE LEAVED SAXIFRAGA.

Decandria Digynia.

Saxifrageæ.

Plant forming a broad flat, close patch: creeping branches short, procumbent, more or less red, and thinly clothed with scattered viscous hairs: stems numerous, about an inch in height, erect, red, 1-flowered, clothed with 2 to 4 pair of leaves. Leaves opposite, obviously ovate, flat or slightly concave on the upper side, bluntly rounded, keeled from the point, smooth and glossy, fringed; old ones imbricately four-sided, thickened towards the point, obliquely truncate, and generally perforated with one or two small pores: those on the young creeping shoots opposite, and more distant: stem-ones opposite, distant, obovate. Flowers large, and very handsome, rose-coloured or lilac, terminal, solitary, and without a footstalk. Calyx glandular: not attached to the ovarium: segments broadly ovate, blunt, succulent, straight, fringed at the edges. Petals 5, obovate, or rose-coloured, 5-nerved. Stamens 10, inserted in the calyx, 5 opposite to the sepals; the other 5 opposite to the petals: filaments smooth, slender, rose-coloured: anthers broadly ovate, bilocular, violet. Carpels 2, connected from the base to a little way up, smooth. Styles 2, terminating the carpels, short, and stout, beaked.

This beautiful little Alpine species is a very desirable plant for growing in pots, to decorate rooms or windows, flowering in March and April. It flowers best in sandy peat soil: the pots require to be well drained with broken potsherds, that the plants may not be injured by too much moisture in winter.

It is also well calculated for ornamenting rock-work; peat, or some other light soil must be placed in the holes in which they are to be planted, and care must be taken that they do not want for moisture in summer, when they form large tufts, and are covered with flowers in spring. They are readily increased by seeds, or by dividing them at the roots.

## LINUM USITASSIMUM.

COMMON FLAX.

Pentandria Pentagynia.—Linn.

Lineæ.

Root small, fibrous. Stem round, slender, leafy, branched, rising to the height of two feet. Leaves scattered, lanceolate, entire, sessile, three-nerved, alternate on the upper part of the stem, of a glaucous, or sea-green colour. Flowers numerous, collected in a corymbose panicle, erect, and supported on longish footstalks. Calyx composed of five lanceolate, erect, permanent, three-ribbed leaflets. Corolla funnel-shaped, consisting of five notched, sky-blue, shining, veiny, oblong petals, which are narrow below, and gradually growing broader upwards. Filaments five, awl-shaped, erect, the length of the calyx, and inserted into an annular receptacle, with simple sagittated anthers. Germen superior, ovate, surmounted by five blue, capillary, spreading, under, bluntish stigmas, the length of the stamens. Fruit a globular capsule, almost the size of a pea, with ten cells, and ten valves united in pairs, and crowned with a sharp spine. In each cell is lodged a single elliptical, pointed, smooth, and shining seed.

Flax grows in many counties of England; and as we have no intimation of its first introduction, it has been supposed to be an indigenous plant. In the simplicity of former times, when families provided themselves with most of the conveniences and necessaries of life, every garden supplied a sufficient quantity of hemp and flax; but although we make clothing from the stalks of the latter, and draw valuable oil from its seed, which likewise serve as food for our cattle, little of it is now cultivated in England. The maceration or steeping, necessary to separate its fibres, renders water so offensive, that acts of Parliament were passed to prevent this process from being carried on in any river, stream, or pond, where cattle drank, under a penalty.

The seed yields a mucilage to boiling water, which is inodorous, and has but little taste. By expression, the well-known oil is obtained which is used in painting, varnishing, and in making printers'-ink. Linseed oil boils at 600°, and does not freeze but with a cold below 0 of Fahrenheit. It is what is called a drying oil; that is, after being exposed to the open air, and absorbing oxygen, it remains transparent, instead of becoming opaque, like what are called fat oils. Linseed, in common with other vegetable mucilages, affords but little nourishment; and, when used as a principal article of diet, it relaxes the organs of digestion, and produces a viscid slimy mucus, and a morbid acid in the *primæ viæ*. A tablespoonful of the oil is an excellent corrector of habitual costiveness, and one of the most useful poultices is made from linseed-meal.

## GRISLEA TOMENTOSA.

DOWNY GRISLEA.

Oct—Dodecandria Monogynia.

Lythrarieæ.

Stem and principal branches erect; cuticle of the bark soon peeling off. Leaves while young more or less brown, afterwards dark green on their upper surface, but much paler underneath, and in old plants nappy or cottony, opposite, almost sessile, wedge-shaped with the base rounded and apparently cordate, nearly horizontal, facing the light in two ranks upon all the branches which are not erect, very entire, obtuse, somewhat shining with short hairs and minute black glands interspersed on both surfaces, but especially underneath: nerves depressed. Flowers from 3 to 15 in short axillary racemes upon almost every branch. Bractes only differing from the leaves in size; some very small. Torus (or partial receptacle of each flower) resembling a calyx, bright red with a greenish base, and retaining its colour till the fruit is ripe, funnel-shaped; below the insertion of the filaments melliferous; somewhat hairy and sprinkled with the same black glands as the leaves. Calyx continuous with the Torus, of 10 or 12 leaflets, the alternate ones very small, all red and broad-wedgeshaped, somewhat hairy and glandulous. Petals 5 or 6, pale red, inserted on the Torus under the smaller leaflets of the calyx which they exceed in length, but scarcely in breadth; very narrow-wedgeshaped, almost smooth. Filaments 10 or 12, more or less confluent at the base, continuous with the top of the nectarium and not inserted distinctly above it as in *Grislea*, all of the the same length considerably beyond the calyx, reclining, awl-shaped and smooth. Anthers dark red, obtuse with a bifid base. Pericarp greenish red, nearly half the length of the Torus before impregnation, sessile, 2-locular, with a central spongy placenta: dissepiments very thin. Style red, thicker than the filaments, reclining, cylindrical and smooth. Stigma slightly two-lobed. Seeds numerous, pale brown, small and wedge-shaped.

Since the introduction of the *Juschia Coccinea*, we have had few plants so ornamental as this beautiful shrub; and it likewise may be propagated very freely by cuttings. It is a native of Hindostan; flowering from May to December.

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## ON THE CULTURE OF CROCUSES.

This, though a well-known flower, has only of late years been accurately studied as a genus. Miller admits only two species, the autumnal or saffron (*C. officinalis*), and the spring crocus (*C. vernus*). Sir J. E. Smith mentions three species as natives of Britain, *C. vernus, nudiflorus*, and *sativus*. Of the former there are several varieties, blue and purple, yellow and white, and striped; and besides these, the following species are cultivated in crocus beds:—*C. versicolor*, or party-coloured crocus, a kind which requires a light loam, while most of the others grow best in sand; *biflorus*, or yellow-bottomed; *mæsianus*, or common yellow; *susianus*, or cloth of gold; and *aureus*, or true gold. The Scotch crocus is a beautiful striped variety. The autumnal crocuses which we have in our gardens are originally wild, and consequently natural species, whilst almost all the spring plants may be considered as garden productions, or if not originally so, they have been so long in cultivation as to have very much deviated from their native types.

The varieties of crocus in the lists of the modern Dutch gardeners vary from twenty to perhaps double that number; but they have only florists' names, and are not arranged in any systematic order, so that those belonging to different classes or species are not distinguishable from each other. It is, however, from the Dutch collections that several of our best varieties have been procured, especially of those belonging to *C. vernus*. New kinds from seed are frequently raised in England and in Holland, and probably much improvement in the beauty of the flowers might result from more attention than has hitherto been paid to their cultivation.

The management of crocuses is not a difficult matter. They succeed best in a light dry soil, particularly in sand, but they do not like frequent removals. Many of the kinds increase rapidly by reproduction of their bulbs, but these blossom well, notwithstanding their being left very thick together. The new bulbs are formed above and on the old one, which is only annual. Each old bulb produces one or more fasciculi or bunches of leaves, and a new bulb is formed at the base of each fasciculus; so that where only one fasciculus is produced one new bulb only is formed. When they have been taken up, the bulbs should be kept out of the ground as little as possible. They may be planted either in circular patches in the border, or in rows across narrow beds, and arranged according to their colours, their classifications, or periods of flowering. A collection looks best when planted in considerable quantity, so that when in rows these should consist of double lines.

The earlier kinds shew their flowers in the end of January or beginning of February, according to the season. The later flowering varieties of *C. vernus* continue in beauty during the greater part of April. Crocuses require no protection in winter, except from mice; rabbits will also eat both the flowers and the leaves of several of the kinds. The common house-sparrow is also fond of pecking the blossoms, especially of the large yellow crocus. The leaves of all kinds are at first short. When the bulbs are in blossom they usually appear shorter than the flowers, but they subsequently grow larger. The practice of cutting away the leaves after the roots have done flowering is improper, and should never be done: they will readily separate from the bulbs at the proper season, and the removing them earlier will materially injure the growth of the bulbs in the present, and the blossoms in the next season. The seed vessels rise above the ground, and the seeds ripen much about the same time that the leaves are in a proper state for removal. At that period the seeds may be gathered, and they should be sown immediately. If the raising of seedlings in boxes be too troublesome, they may be sown in a dry warm border, to remain till they blossom, when a selection of the sorts to be kept may be made.

The bulbs produce one or more buds, and every bud a fasciculus, which, if sufficiently strong, produces one or more flowers, accompanied by a certain quantity of leaves, the whole being sheathed in external membranous coverings, which are always present in greater or less number, and are of different lengths, the outer ones being always the shortest. Each separate flower is supported by an under-ground three-sided scape; and some species have a membranous sheath, at the base of the scape, which sheath extends a little above the summit of the scape, or about on a level with the germen. Each flower has also, in all the species, at the base of its germen, either one or two bracts, which enclose the flower before it rises and expands. Where two of these bracts exist, one is always included within and opposite to the other. These and other circumstances respecting the scapes, sheaths, bracts of the flowers, smoothness of the filaments, &c., are of importance in distinguishing the species, which skilful botanists well understand, and closely investigate.

## ON THE CULTURE OF TULIPS.

The Tulip, according to Gesner, is a native of Cappadocia, from whence it was introduced into Europe in 1559. It seems certain, at any rate, that the present improved varieties have been obtained by art during the two last centuries, and chiefly owing to the exertions of Dutch, French, and Flemish florists. The rage for tulips was indeed so prevalent at one time in Holland, that it is said property to the amount of many hundred pounds sterling was given for a single root, and that the legislature saw fit to check such an infatuation, by enacting that no tulip or other flower-root should be sold for any sum exceeding about *fifty pounds sterling*.

The word Tulip is said to be derived from the Turkish, *tulipan*, signifying a cap or head-dress. It is divided into two classes, according to those having early or late flowers—the late being infinitely the most valuable. These have usually been subdivided into five distinct families, the first four having white bottoms or grounds, the other yellow grounds. The most proper time to plant tulip-roots is from the end of October to the 10th of November. The situation for the best bed should be in an open airy part of the garden; when that is fixed upon, the ground should be marked out agreeable to the intended dimensions, and the soil taken out twenty inches deep. The bottom is then to be filled up with sound fresh earth ten inches thick, upon which is to be placed a stratum of two years' old rotten cow-dung, and earth of the above description, about one-half of each, well mixed together, twelve inches thick; and again upon this is to be placed another stratum of the same kind of earth as that of the bottom, of about two inches thick at the sides, and three at the middle, to give the bed a small degree of convexity. Let all this be done a week or two before planting, to give the bed time to subside. Immediately before planting rake the surface of the ground, still preserving its convexity, and mark the exact situation for every root upon it, the proper distances being seven inches from centre to centre; and if the rows are seven inches asunder, the roots will form squares of similar diameter.

Having sprinkled a little clean sand where the roots are to be set, place them with great exactness, and add some very sandy earth, so as to completely envelope each root in a little cone; then cover the whole very carefully with strong fresh loam, about four inches thick at the middle of the bed, decreasing it to three inches at the sides—the largest and strongest roots having been placed in the centre rows. The soil made use of for covering the bulbs should be frequently turned over and thoroughly exposed to sun and air some time before being used, that it may be freed from the acrid quality that otherwise might attach to it. Four inches is the utmost of this soil that should be placed above the upper side of the large roots, and three above the small.

The bed may next be hooped over, and mats should be at hand to protect it from heavy rains and severe frosts; but moderate weather should be allowed to act on the bed. By the end of February every plant in health will be visible above ground. If any distemper or canker is now discernible,

either above or an inch or two below the surface, it should be carefully cut out with a sharp knife, and the wounded part left exposed to the sun and air, which will presently heal it, a fine dry day having been chosen for such an operation. It may be well to stir the surface of the soil, to admit the air generally over the bed more freely than its winter coat will allow.

By the end of April, some of the plants will probably be so tall as to almost touch the hoops; this must be avoided by raising the arch; and as soon as any of the earlier sorts begin to shew colour, they should be shaded from the sun; for when the heat is strong, it causes the colours to run and intermix, so as to destroy the splendour of the flower. Some sorts may be spoiled in five minutes. When the greater part of the blossoms begin to open, the awning should be erected, so as to keep out rain, but admit as much light and air as possible, except in windy weather, otherwise the grandeur will be lessened as effectually as by too much of the sun. Tulips never require to be artificially watered, at any period or weather, from planting to taking up; nevertheless, moderate rains may always be admitted before, and, in small quantities, after the bloom is over; but, early in spring, they are absolutely necessary in order to procure a strong bloom.

If any roots should perish, or fail to produce flowers, the deficiency may be made good by digging out the useless plant by means of a strong tin tube, and inserting into its precise place a healthy specimen from the off-set beds, which has been lifted in the same careful manner; the tube consisting, as it must do, of two pieces, may be dexterously removed by a wire, which should bind it together, being loosened as soon as the transplanting is accomplished. A little soft water will be required to the newly introduced plant.

About a week or ten days after full bloom, when many of the petals begin to drop off, and as the leaves and petals of any fall off, the seed vessel of such should be immediately broken off close to the stem, for if suffered to remain on the plant, it will procrastinate the period of its maturity, and weaken the root considerably. After remaining about a fortnight longer, the foliage will become of a yellowish brown, and two or three inches of the top of the stem will wither and become purplish; this denotes the critical period to take up the roots, because, if done earlier, they will be weak and spongy, and if deferred later, their juices will become gross, as will be manifest at the succeeding bloom, by too great a redundance of colorific matter in the petals, and the flowers will be what is generally termed foul.

When the roots are taken up, they are to be gradually dried, and placed in a situation where they may remain so. It is not necessary to do any thing more to them till August or September following, at which time it becomes proper to take off their loose skins, fibres, and such off-sets as are easily separated, observing not to leave the roots too bare, because the air would dry up their juices too much. The last brown skin should remain till the time of planting, when it should be entirely stripped off, and the root left bare and white, great care being taken to avoid wounding the root, especially at the lower end, which is at this period extremely tender. The smallest off-sets, particularly such as are provided with a brown skin, may be re-planted, as soon as they are taken up, about an inch and a half deep, in a fresh sandy loam, in a dry situation, and the bed defended from heavy rains; or, instead of replanting them so early, they may be preserved from the air by being buried in dry sand till the autumn, and are then to be planted with the larger roots, but not so deep.

Tulips are hardier, and less liable to injury from frost, than most kinds of flowers; but hail storms are very injurious to their foliage; early in the spring, therefore, though it is not absolutely necessary to cover the inferior sorts during a common winter, it is highly proper to defend them against hail, which, wherever it strikes, inflicts a wound.

To procure new varieties of this plant, the best sorts of Breeder Tulips, a name they are known by, should be procured. These consist of one plain colour, on a white or yellow bottom. But no person should make the attempt who is not possessed of a great fund of patience and perseverance, as the period of procuring finely broken tulips from breeders is very uncertain, so much so that it is not unusual to wait ten or twenty years without the desired success, although it sometimes happens fortunately to take place the first, second, or third year of their blooming. Where the collection of breeders is numerous, there may be reasonable hopes of procuring one or two valuable new flowers annually. A dry poor soil is most likely to produce these effects; and an instance has occurred where forty breeders out of fifty became broken or variegated in one season, in a situation of this description.

New sorts of breeders are procured from seed, but such only as have very tall strong stems, with large well-formed cups, clear in the bottom, are worth cultivating. The seed should be saved from the most perfect breeders, in preference to the finest of the variegated or broken sorts, as the seed of such produces nothing but poor weak breeders of no value. It should remain growing on the stem till the pericarpium or seed-vessel becomes of a brownish colour, and begins to open. It should then be cut off, with six or eight inches of the stem, and placed afterwards in a dry, airy, cool situation, where it may remain undisturbed till the time of sowing. It should be sown about half an inch below the surface of the soil, in a deep box, filled with a compost consisting of one-third coarse sea or river sand, one-third fresh sound earth, one-fourth rotten cow-dung, at least two years old, and earth of decayed leaves for the remainder. The box should afterwards be placed in a warm situation during winter. It will never require to be watered, or have any other attention paid to it, than to keep it free from weeds and frost, till it has remained in this state two years. It must then, on the approach of winter, have an additional stratum of the compost placed upon it, about half an inch thick; and at the third year, in July, the roots may be taken up, dried and treated in the same manner as the large bulbs or off-sets. Some of the seedlings will bloom by the fourth or fifth, and most, if not all, by the seventh year.

What has hitherto been said regards the late blowers; as to the early tulips, it may be sufficient to state that they should be planted a month or six weeks earlier, at rather a less depth, and in a warmer situation; they will then blow in March or April following. Their stems are much shorter, and their properties in general are much inferior to the class previously described, and therefore a particular account of them is not called for.

A fine variegated late tulip should have its stem strong, elastic, and erect, and about thirty inches long. The flower should be large, and composed of six petals; these should proceed a little horizontally at first, and then turn upward, forming almost a perfect cup, with a round bottom, rather widest at the top. The three exterior petals should be rather larger than the three interior ones, and broader at their base. All of them should have perfectly entire edges, free from notch or serrature. The top of each should be broad and well rounded; the ground colour of the flower at the bottom of the cup should be clear white or yellow, and the various rich coloured stripes, which are the principal ornament of a tulip, should be regular, bold, and distinct on the margin, and terminate in fine broken points, elegantly feathered or pencilled. The centre of each leaf or petal should contain one or more bold blotches or stripes, intermixed with small portions of the original or breeder colour, abruptly broken into many irregular obtuse points.

Such are the rules and features which have long been recognised by some of the most skilful florists, as respects tulips, and which have been laid down many years ago, in standard treatises on the subject.

## BERKSHIRE.

This is one of the most beautiful inland counties of England. It is bounded on the north by Oxfordshire and Buckingham-

shire, from which it is separated by the Thames; on the east by Surrey; on the south by Hampshire; and on the west by Wiltshire. At the north eastern corner, it comes slightly in contact with Gloucestershire. It is of a very irregular figure, its whole northern side being bounded by the sinuosities of the river Thames, which, taking a southern course from Oxford, almost cuts this county asunder at Reading. From east to west it extends about forty-two miles; from north to south, in its widest part, it is about twenty-eight miles; but in its narrowest, it is not more than seven. It contains about 483,840 statute acres.

The boundaries which nature has assigned to Berkshire, are in general highly picturesque. The Thames, meandering in a very varied line along its northern and eastern sides, and the hills of Surrey and Hampshire on the south, are charming lines; while from the eminences in its western extremity, the eye is gratified with many enchanting scenes in the adjoining counties of Gloucester, Oxford, and Wiltshire. The face of the county though generally not hilly, is undulating; yet in some parts, and those near the Thames, the grounds rise rather abruptly, and thereby confer beauty and diversity on the landscape. It is needless to advert to the beauties of Windsor forest. They were immortalized in song by Pope, long before they had arrived at that degree of imposing grandeur which they now present.

Berkshire is divided into four great sections: the White Horse Vale; the Chalky Hills; the Vale of Kennet; and the Forest Division. Its civil division is into twenty hundreds, containing ten market towns, and 148 parishes. The county is in the diocese of Salisbury, and in the Oxford judicial circuit. The population in 1801, amounted to 109,215, and in 1821, to 131,977 souls. The climate, though somewhat various, is in general pure and salubrious. In elevated and exposed situations, particularly in the central parts, along the course of the White Horse Hills, the air is keen and piercing; but in the more sheltered and champaign spots, it is equally exhilarating and delightful; being esteemed salutary to the most delicate constitutions. From the situation of Berkshire, as respects the metropolis, the salubrity of its climate and the general beauty of its scenery, the county has been chosen by many of the nobility and gentry for a residence; and their comfortable and magnificent seats are numerous.

The substratum of Berkshire may be said to consist, in general, either of chalk and other calcareous matter, or of gravel, with clay, at greater or less depths, according to the quality of the soil. The White Horse Vale is remarkably fertile, and its prevailing soil is a strong, grey, calcareous loam in which vegetable mould is intimately mixed with cretaceous earth. Among the Chalky Hills, there are some intermediate tracts of considerable fertility, where the superficial stratum is composed of vegetable mould, mixed with chalk, flint, and gravel. These hills in general form excellent sheep walks, being covered with a fine turf. In the Vale of Kennet, gravel soils predominate, varying however, considerably in their qualities, admixtures, and depths from the surface. In this district, there is a peculiar kind of peat, which is equally valuable as fuel or manure. The northern parts of the forest district are distinguished by a soil of gravel, strong loam, and clay; the central parts by a tenacious clay; and the southern parts by sand and gravel.

The agriculture of the county, as may be expected, varies much according to its locality. On the gravelly soils, though good barley is raised after turnips, it is liable to suffer in dry seasons. Wheat and beans are well cultivated, and the facilities of water carriage contribute to bring much manure from London and other distant parts, while the peat found on the banks of the Kennet yields ashes that are of great value to the soils near the river; more than one half of the land is calculated to be under tillage; about one quarter is pasturage, and the remainder consists of woodlands or uncultivated heaths, affording only scanty food for sheep.

Few parts of England are better supplied with the facilities of water communication than the county of Berks. It is connected by means of the Thames, which runs round or through it on one hand with London, and the sea, and on the other with the Severn, at two separate points on that river; one through the Thames and Severn Canal with Gloucester; the other through the river Kennet, and the Kennet Canal, with Bath and Bristol. Besides the navigable rivers, it enjoys the benefit of the Wilts and Berks Canal, which connects the Thames at Abingdon with the Avon at Trowbridge in Wiltshire, and communicates with the Kennet and Avon Canal. The other rivers which fall into the Thames, are the Oak, the Laddon, the Auburn, and the Lambourn.

The landed property of Berkshire is happily divided for the purposes of agricultural improvement. Great estates are rare; and even in the lower part of the county, where there is least division, the yeomanry is respectable both in number and circumstances. In the upper part are several seats, on estates not exceeding 100 acres. One of the happiest consequences of this state of property is, that the scale of rank ascends almost by imperceptible gradations, from the lowest to the highest, and all classes of the community are connected by close bonds. The yeomanry, depressed by no slavish dependence on superiors, nor overawed by the glare of disproportionate granduer, feel within themselves all the native dignity of man, and cherish those lofty and generous sentiments of independence which should animate every free-born heart. This exalted class have a reciprocal influence on the character of men of rank and great fortune. Aware that no ascendancy can be obtained over the minds of their neighbours by the arts of corruption, they choose the more honourable way of securing their favour by meriting their esteem. It was observed by the late Mr. Pitt, that "no minister of this country could command ten votes in Berkshire."

From such a state of property as has been described, it may be supposed that there is often a considerable number of estates in the market. They are frequently purchased on speculation, and sold out again in lots; and so general has been the violation of entails, that few estates are now occupied by the lineal descendants of those to whom they belonged two centuries ago. The average value of freehold estates may be given at 28 years' purchase, net-rent. Though by far the greatest proportion of Berkshire is freehold, there are copyhold lands in different parts of the county, held by different tenures, according to the customs of their respective manors. Leases on lives, and leases renewable every seven years, under deans and chapters, and other corporate bodies, are pretty frequent. But the benefit of these leases is almost wholly destroyed by the magnitude of the sum demanded at their renewal. A few estates are held by leases of 1000 years; and others on one or three lives by individual proprietors; but this practice is rare, and renewals are generally refused.

The farms are of all sizes, which induces men of different capitals to apply themselves to agriculture, and to emulate each other in their schemes of improvement, and in their efforts to obtain an independent and comfortable livelihood. The rent is generally paid in money, except when lands are held under colleges and chapters, where the usual preservations of corn-rents, and sometimes of malt, are still retained. Stipulations are seldom made by the proprietors for any services beyond what are connected with the repairs of buildings, on the respective farms, and an allowance is generally made to the tenant of from three to six months' rent in hand. Besides great quantities of wheat, and abundance of barley, reared in every part of Berkshire, there are many large dairy farms, particularly in the White Horse Vale. The cattle are large and valuable; but there are here no native or peculiar breeds. One farm is famous for cheeses made in the shape of pine-apples, which sell at a considerably higher price than those of the common form. Berkshire has a peculiar breed of sheep. the distinguishing features of which, are their great size, their height on the legs, and weight when fatted; they have black faces, Roman noses, black and mottled legs, and long tails. They are particularly adapted to the low and cold lands; and

when fatted, vary as much as from fourteen to forty pounds a quarter. The native hogs of this county yield to none in the world for compactness, easiness of feeding, and the size to which they can be brought. They are usually crossed once in six or seven generations, with the Chinese or Tonquin race, which prevents them from degenerating. There are few manufacturers in Berkshire; the most important is that of copper, at the Temple Mills.

From what has been said, it is evident that Berkshire is far advanced beyond many counties in the empire, in an agricultural point of view. To its natural advantages—those dependent upon soil, and local situation as respects the two principal rivers of England—and to its vicinity to London, and other large towns, a great deal is to be attributed; whilst the intelligence, and the conditions of the cultivators of the soil are admirably calculated to make much of their opportunities. It may be remarked, however, that the farmers of Berkshire, like not a few of their order throughout England, are tardy in adopting manifest improvements in the management of their lands. For instance, what used to be called the "common Berkshire plough," and which we believe has not been altogether discarded, is such a heavy complex instrument, as to intimate that the prejudices are so great and absurd on the part of those that use it, that the utmost intelligence and enterprise in any point, cannot be supposed to prevail in the neighbourhood where such an article is used. Its massy beam with two untoward wheels, its clumsy shear and mould-board, may well require four horses to drag such an instrument through the ground, and show that it is better suited to trench than to till. It may suit very well too, for allowing the holder to stare round him, crack his jokes with the plough-boy, or even occasionally ride on the stilts, but it never will be the instrument that a dexterous and profitable ploughman can desire to handle and guide.

The prejudices spoken of have gradually and very considerably however given way in Berkshire, through the collision of opinions, and the diffusion of knowledge. Yet not a little is still to be done before the mass of farmers in this county are fully enlightened as regards the principles and utmost capabilites of their art, with such opportunities as they possess. It is true it is not always that speculative and experimental farmers are the most successful, and hence ignorance has often been hardened beyond its simple and ordinary obduracy. But the union of knowledge and practice must ultimately prevail, as has indeed been proved in the cultivated and most profitable counties or districts of the island.

Besides prejudices, other obstacles to agricultural improvement exist in this county, but as these are not peculiar to Berkshire, we need do no more than name them, such as —tithes—the want of leases on rational principles—common fields—poor-rates—taxes on agriculture, &c.

## GARDENING OPERATIONS FOR MAY.

For thee, sweet month, the groves green liveries wear,
If not the first, the fairest in the year:
For thee the Graces lead the dancing hours,
And nature's ready pencil paints the flowers.

May has ever been the favourite month of the year, in poetical description; but the praises bestowed upon it took their rise from climates more southern than ours. In such, it really unites all the soft beauties of spring with the radiance of summer, and has warmth enough to cheer and invigorate, without overpowering. With us, great part of the month is often too chill for a perfect enjoyment of the charms of nature; and frequent injury is done to the flowers and young fruits during its course, by blights and blasting winds. The month upon the whole, even in this country, is sufficiently profuse of riches and beauties. The earth is covered with the freshest green of the grass, and young corn, and adorned with numerous flowers opening on every side. The trees put on all their verdure. The hedges are rich in fragrance, and the orchards display their highest beauty in the delicate blush of the apple blossoms. The produce of the soil too is becoming abundant in the freshest and most delicate vegetables.

*Kitchen Garden.*

If it was not done last month, sow kidney beans now. Plant the scarlet and white running French beans: the scarlet is the best bearer. Either of the roots will do very well without staking, if the runners are kept constantly cut off; they will also bear plentifully by using this method. To have a constant supply of green peas, sow a crop as soon as the last sown comes fairly above ground. The tall growing sorts are the best for sowing at this time of the year. If the ground be light in which they are sown, tread the rows with the feet. Hoe the ground between the rows, and rake off the weeds. Set broad beans when the last planted come up, and hoe and draw up the earth to the stems of those advancing to height. If the forward sown beans are in blossom, cut off their tops, which makes them fill quicker than if left alone. Plant out cabbage two or three different times in the course of the month, unless it has been previously done. Plant out some red cabbage about the beginning of the month. All kinds of cabbage seed may be sown twice in the course of May. Red and white beet-root may be advantageously sown also, either in drills or broad-cast. Sow carrots and onion seeds about once a fortnight, that a constant supply may be secured afterwards. To have a succession of brocoli, also sow the seed two or three times in this month. Each sort should be by itself, and if the ground is not of a binding nature tread the seeds in, and rake the ground afterwards. Savoy, red and green broccoli, Jerusalem kails, and Brussels sprouts may now be sown. Keep sowing the round-seeded spinach, to have a constant supply of it; let it be put in shallow drills, between the rows of peas and beans. Radish seed should be sown every eight or ten days. White mustard, rape, cress, and turnip, for salad, will now do best on an east or west border, which is shaded a part of the day. Prick out celery plants in beds, and water them well in dry weather. Celery seeds sown in the beginning of the month will do to plant out in the autumn. Asparagus in warm situations will now be fit to cut. When the shoots are four or five inches above ground they may be cut. Sow a small bed of cauliflower every fortnight, in wet earth, and water it well in dry weather. Plant out cauliflower also in deep rich ground, once a fortnight, that a constant supply may be secured. Sow the seeds of curled parsley; draw a shallow drill for it, and cover it with two inches deep of earth, giving them water in dry weather. Transplant summer savory, borage, burnet, basil, marjoram, &c. Prick them in beds or in pots, and set them in frames, if it be wished that they grow quickly. Sow turnips every ten or twelve days, and thin with the hoe the former sown crops of them. If the insects begin to eat the tops, strew a little lime or soot over them. The ground should be well rolled any time before they begin to make bulbs; yet the best time to do so, or to tread the ground, is when the seed is sown. Carrots, parsnips, and onions, may now require hoeing, thinning, and weeding. Sow the seeds of lettuce as often as may supply lettuce plants to set out every week. Endive for an early crop may be sown about the beginning of the month. Cammomile, pennyroyal, balm, mint, hyssop, savory, sage, thyme, sorrel, &c., may be propagated now by slips; and lavender, rosemary, rue, southern wood, &c., by cuttings. If the capsicums sown in the preceding months are strong, they may be planted out in good earth towards the end of May. In dry days, take the opportunity to hoe up weeds everywhere in the garden, and rake them off the borders. Weeds should never be allowed to produce seeds; and it is to be remembered that chick-weed and some other sorts seed very early. Uncover mushroom beds once a week; clear them of weeds and wet litter; put a little clean hay next the bed, and a sufficient covering on them, to keep the cold and heavy rains out. This is still a good time to plant potatoes.

*Fruit Garden.*

Let trees which were budded last summer be frequently looked after. Tie up the shoots of new budded trees, with a bit of bass to the part of the stem left above the bud. New grafted trees require no more clay, when the graft and stock are well united, which will probably be effected by the end of this month; the clay may therefore be taken off after a shower of rain. Keep strawberries clear of weeds, and water them plentifully in dry weather. Grape vines should now be divested of all useless shoots, stopping them at proper distances before the fruit. If as some do, all the old wood of the vines be cut out every year, care must be taken to train up, from the bottom, a sufficient number of young shoots, to be bearing wood for the ensuing year; but shoots on which the bunches are shewing, must be stopped two or three eyes before the bunches. Snails are now frequently hurtful. The evenings and the mornings are the seasons for finding them. Peaches, nectarines, apricots, cherries, and plums and wall-trees, in general, are apt at this season to be infested with insects; means must therefore be resorted to, to cleanse them; the curled leaves should be picked off with a view to check their propagation; tobacco dust, or washings with an infusion of tobacco, are sometimes used with advantage; but water sprinkled plentifully over the branches with an engine constructed for the purpose, is perhaps the best remedy. The beginning of this month is still a good period to head down any old plum, pear, cherry, or apple trees, that do not produce good crops of fruit. If, during the autumn before, fresh mould have been added to or dug in about their roots, the old exhausted parts having been removed first, the productive power will be promoted, for it is the want of good earth and seasons, which chiefly occasions barrenness in trees. As respects the Fruit Garden generally, this month, great attention is required to the trees. Those on walls should have their best shoots placed laterally, and all ill-placed as well as superfluous parts removed. Fruit, when standing too thick, must be thinned, and a general order of correction gone into for the future economy of the trees, in so far as the ensuing season is concerned.

*Flower and Pleasure Garden.*

Let the auricula plants in pots, which are past flowering, be placed in some situation where they may enjoy the free air and the sun, till about ten o'clock in the morning. This is a good time to fresh pot them, which should be done annually. The best mould for them is that of a light sandy nature, of a blackish colour, mixed with perfectly rotten dung, and a little vegetable mould. Tender annuals should be transplanted into newly-formed hot-beds, when they are wished to flower early, and in full perfection, particularly balsams and cockscombs. The seeds of many flowers may now be sown, and perennial and biennial plants that were sown last March, will be fit for transplanting about the end of this month, into beds, where they may remain to acquire strength. Every kind of seed lately sown, if the ground be not sufficiently moist, will not come up in dry weather, but will lie in the ground several weeks, and appear after rain.

*Nursery Garden.*

There are some kinds of shrubs which strike most freely from layers of young shoots laid down in the beginning of summer; and a few may be long enough about the end of May for this purpose. Plantations of trees and shrubs of all sorts made in the course of the spring, ought to be watered in dry weather. Cover the ground with moss round the stems of tender shrubs, and in the middle of very hot sunshine days the seedlings of arbutus, cedars, pines, cypress, &c. should be shaded. Some kinds of evergreens may yet be transplanted. In newly grafted trees, let all buds under the graft be carefully removed; and the clay and the bandages withdrawn, if the grafts have united; or if the union be not sufficiently firm, the tyings should be loosened and put round again.

*Hothouse and Greenhouse.*

This is a good time to shift all kinds of exotic plants in the hothouse; and every inmate should receive water and air freely, particularly in bright weather. Nothing is known as a more effectual preservative against the inroads of insects—to speak of nothing else—than a good temperature, cleanliness, plenty of air in fine weather, and refreshing applications of soft water. This is also a good time to sow seeds of greenhouse plants, to raise others from cuttings, and to shift those that were not shifted last month. Smoke occasionally the greenhouse with tobacco, to keep the plants free of some sorts of insects, which are apt to be troublesome.

*Journal of a recent Visit to the principal Vineyards of Spain and France.* By James Busby, Esq.

THERE are some things of which every man who lays claim to general knowledge pretends or believes himself to be a competent judge. Of these, *horses* and *wines* are probably the most prominent. One cannot more certainly give offence than to doubt a gentleman's connoisseurship respecting any of these subjects. Where is the man-milliner who has not a volume of phrases about the points of a horse, or of achievements in proof equally of his skill as a jockey, and eminence in manly accomplishments? There may be a few within the sound of Bow bell that ne'er did yet bestride the noble quadruped, and whose love of truth forbids them to measure the lance of equestrianship with their compeers of the counter. But this we are sure of, that no one will be silent when the juice of the grape is the subject of discussion. Every man smacks his lips, looks knowing, and rubs his hands, when the merits, for instance, of black-strap are debated. To doubt his knowledge and taste in this particular is to doubt his claims to the rank of gentleman. And who can stand this?

There is a prodigious deal of nonsense and ignorance shown off with regard both to the one and the other of the two popular topics above named, especially the latter, which the convivial slang that is so prevalent, hides and disguises. The little volume before us has led us to perceive this more clearly than we ever did. It is not only the young and the vain that betray their rashness in the fields alluded to; regular topers, those that have grown grey in the service, are, it would appear, far from being acquainted with the character and history of the god they do homage to; nay, the writers of books on wines seldom present such well-authenticated facts and sound practical information as can be profitably referred to. These have chiefly been merely amateurs and theorists. The conjectures and speculations of persons who have never visited a wine country, or who have only hurried through one in a diligence, are alike barren of information and entertainment. So that, as the editor of this little treatise says—works upon wines are often the *driest* of all reading, having neither the grace of fiction nor the utility of truth.

This treatise is evidently an exception. To any one at all acquainted with rural or agricultural subjects, it must at once appear the production of an intelligent, experienced, and careful inquirer; one who understands the sciences as well as the practices brought into display by the most enlightened cultivators of the soil. Besides his skill in rural economy, the author exhibits himself in a highly patriotic character. He has been settled in New South Wales for some time; but, on a visit to Europe a few years ago, he proceeded to the South of Spain, and through various parts of France, in the hope that his observations might be useful to the colonists whom he had left, deeming that few things could be of more benefit to them than a knowledge of the agriculture and rural economy of those European countries whose climates are most analogous to theirs. The present little work is the result of this journey, and those observations. It was originally published in the colony to which he belongs, for he was fully aware how few of the varieties of vines, previously imported thither, had agreed with the climate, and he therefore spared neither

trouble nor expense in obtaining all the varieties of the different districts through which he travelled. A very considerable number were collected by himself from the different vineyards he visited, of the qualities of each of which he obtained a short notice on the spot. Of the other varieties, amounting to upwards of 500, which he obtained from the Botanic Garden of Montpelier, and the Royal Nursery of the Luxembourg at Paris, he thinks it probable that some will prove different from others in little more than the name, and that some may be of little or no value. But, knowing the changes produced by change of climate in the vine, he thought it possible that some of those which were reckoned of least value, where they were, might yield the most valuable products in the colony.

The degree of spirit with which the plantations of vineyards had commenced in the colony, previous to the author's departure, in February, 1831, left in his mind no doubt of ultimate success. He himself had been the medium, he tells us, of distributing upwards of 20,000 vine cuttings among upwards of fifty individuals, during the previous season. Very fair wine, too, had been made during two successive seasons, proving, beyond a doubt, that the colony was capable of yielding a very superior produce, from vines of a greater age, and on a more suitable soil than that which the vineyard possessed that had yielded the wine. There was one important product upon which the colony had little or no information, and upon which, although it formed a principal object of the author's expedition, he is happy to say there is little knowledge requisite: this is raisins. Besides his valuable and accurate remarks on the cultivation and manufactures of the products of the vine, the treatise contains some useful observations on the culture of the olive and other fruit trees.

We have sometimes heard people talk very decidedly of the precise age of their sherries. Let us see what the author says of the practices of the wine merchants at Xeres, as bearing upon this point. Xeres is reckoned one of the richest, if not the very richest, town in Spain for this sort of wine, in proportion to its population.

"The wine merchants of Xeres never exhaust their stock of finest and oldest wine. According to the price at which the wine expedited to the market is intended to be sold, it contains a larger or smaller proportion of old wine. But it is only in wines of a very high price, that even a small portion of their finest wines is mixed. What is withdrawn from the oldest and finest casks, is made up from the casks which approach them nearest in age and quality, and these are again replenished from the next in age and quality to them. Thus a cask of wine, said to be fifty years old, may contain a portion of the vintages of thirty or forty seasons.

"The more respectable of the wine merchants of Xeres never ship wine for England till it has attained the age of two years; that is, till the bulk of the wine has attained that age. But, according to the price it is proposed to bring, it contains a larger or smaller mixture of a more or less expensive wine. The higher qualities of sherry are made up of wine the bulk of which is from three to five years old, and this is also mixed in various proportions with older wines. Thus, from the gradual mixture of wines of various ages, no wine can be farther from what may be called a *natural wine* than sherry. But, besides giving the wines, as they are prepared for the market, mellowness and richness, by the addition of older wines, there is a very dry kind of sherry called *Amontillado* or *Montillado*, which abounds in the peculiar nutty flavour that distinguishes sherries, and which is frequently added when that is deficient. Being very light in colour, it is also used to reduce the colour of sherries which are too high; and when, on the other hand, colour is required, the deficiency is made good by the mixture of *boiled wine*, or rather of *boiled must*."

Low priced wines are largely mixed with brandy, being intended for the consumption of a class of people who can only judge of wine by its strength. But brandy is added in very small quantities to the good wines—never in greater quantities than four or five per cent. while they remain in the cellar, and frequently not at all, except on their shipment, when a small dose is added, to make them bear the voyage, as it is said, but in reality because strength is one of the first qualities looked for by consumers. Within the environs of Xeres the author visited several vineyards, and sometimes inspected the process of manufacturing wine. In reference to one occasion he says—

"In the cellar there were four presses, which consisted of nothing else than large wooden troughs, about eight feet square, and from twelve to fourteen inches deep. This is the general size, and each will contain, at one time, as many grapes as will yield a butt of wine. A coarse wooden screw stands in the centre of the trough, which is worked by a lever not more than five feet long in all, so that each arm is only two and a half feet. In some of the casks which contained the juice that had been last pressed, we observed a vessel, like a very wide funnel, fixed into the bung-hole. The object of this is to return into the cask all the froth and wine which is thrown up in the fermentation; for, in this part of Spain, all the wine is fermented in butts, with only the bung-hole open. By this means all the yeast, which the French are so anxious to get rid of, is returned upon the wine—*to feed it*, as they say. The consequence, of course, is a renewal of the fermentation whenever there is a change of weather, or the cask is put in motion. The wine continues in the butt in which it is fermented till March, when it is racked off the lees. This is the almost universal practice of the country."

An olive oil press is a very clumsy affair, as shewn our author in the neighbourhood of Seville. It consists of a beam of immense length, and not less than five cubic feet in thickness at the thickest part. The pivot or hinge on which this lever works, is placed at about one-fourth of the length of the beam from its thickest end. The long arm of the lever is pressed upwards by a screw, and the thick end is thus of course pressed down upon the olives, which are placed under it, enclosed in a kind of mat made of grass, after having been broken in a mill. A good olive tree will yield from three to four *fanegas* of olives in a good year, and a *fanega* will yield an *arroba* (about four and a half gallons) of oil.

It seems that in no part of Spain do they ferment the stalks, or even the skins of the grapes in the manufacture of white wine, but Mr. Busby says, were he concerned in the business, he should certainly attach much importance to, and expect important results from, a trial of the system of large vats and the fermentation of the skins, in order to avoid scuddiness.

There are three distinct sorts of raisins—1st. The Muscatel, which is the finest, the principal cultivation of which is within two or three leagues of the coast, and in the neighbourhood of Malaga. 2ndly. The Sun or Bloom raisins: these are prepared in a manner in every respect similar to the Muscatel, but from a different grape, a very long grape, called in the country *Uva larga*. 3rdly. The Lexia raisins, which are of an inferior kind, and require to be dipped in a lye (Lexia) of wood ashes, with a little oil, before drying. The *Muscatel Gordo* of *Roxas Clemente* is a large white grape. The following is the author's account of the manner of its cultivation:—

"We arrived at the country-house of Don Salvador about nine o'clock, and, after a substantial breakfast, sallied out to examine the vines. Six or seven workmen were employed in preparing the ground for planting, within a short distance of the house. They did not trench the whole of the ground, but dug out square holes about two feet in diameter, and not more than 20 inches in depth. The distance of the centres of these holes from each other is seven feet, and this is the distance at which the vines on the hills round the Malaga seem invariably to be planted. The vineyard I was examining, as well as those in its vicinity, consisted of a series of steep hills. The soil everywhere was a decomposed slate, mixed with abundance of gravel of the same substance. On the higher part of the ground this soil appeared rather hard, and required great labour to break it up, but once broken up it is loose for ever; so much so, that it slides away from under the feet, even where there is only a slight slope. There is no difference made

in the distance at which the vines are planted, between the hills and the valleys; although in many places, on the former, the shoots scarcely extend more than ten or twelve inches, while in the valleys they extend to the length of as many feet. They never, under any circumstances, manure these vineyards: they say it would give more wood, but would not add to the quantity of the fruit. The branches are pruned closer to the stock than those of any vines I ever saw; nothing but the half-formed buds, at the junction of the old and new wood, being left to produce the wood of the succeeding year. I could not find an instance where the spur had been left long enough to include the first full-formed bud, which is generally from half an inch to an inch from the junction. The number of shoots seemed almost unlimited; I counted from 10 to 22; there was scarcely any vine had fewer than 10, and they generally had from 12 to 15. The stock was close to the ground, and not the slightest effort made to raise the shoots, or support them from the ground. Almost every bunch would therefore lie on the ground; and, were the soil of a less gravelly description, the greater part would, without doubt, be lost. After the pruning, they dig over the ground and lay bare the stock, in order to scrape off the *barbe*, or small thread-like roots which are near the surface. As scarcely any grass or herb vegetates among these vines, and the soil is always sufficiently loose, it is evident that they require little digging or cleaning. We went out to visit a peasant, a neighbour of Don Salvador's. He said four or five very fine vines might yield raisins enough to fill a box which contains an *arroba* of 25 lbs.; but throughout the country it would require, on an average, nine or ten. The grapes lose about two-thirds of their weight in drying: this would, therefore, give a produce of 7 or 8 lbs. of grapes to each vine—a calculation which I should think must include a much greater proportion of stinted vines than of luxuriant ones; for the majority of those in Don Salvador's vineyard would, I have no doubt, yield double that quantity. Including, however, those vines which are visible at the tops even of the highest hills, the calculation is likely enough to be correct."

The grapes, when dried, are worth double what they would yield made into wine, and therefore they are never made into wine unless spoiled by the rain, Nothing can be simpler than the manner in which they are dried.

"They usually commence gathering the grapes about the middle of August, choosing only such bunches as are ripe. They return, after a week or two, to make another selection, and so on for a third or fourth time. A place is always reserved in the vineyard, free from plants, on which to spread the grapes when gathered; and they choose a spot where the soil is of the darkest colour, in order to its keeping the full force of the sun's rays during the day, and retaining the heat during the night. The bunches are spread out separately on the ground, and never allowed to press upon each other: according to Don Salvador they are only once turned over. At the end of fifteen days they are, in general, sufficiently dry. This season was more unfortunate for the early commencement of the rains than any season for many years, and the crop was remarkably fine. It is Don Salvador's intention, in future years, to have wooden *toldos*, or awnings, prepared to shelter the grapes, while drying, against the rains, and also to cover them during the night. He says that the drying of the grapes is so much retarded by their being exposed to the dews during the night, that when he has the means of covering them at night, he expects they will be dried in half the time usual at present. Before the bunches are spread out, the small grapes are picked out, as well as any which may happen to be injured: the small grapes are dried separately. I saw a heap of them in Don Salvador's house, which had the appearance of very large currants. When the grapes are turned, any spoiled ones are, or ought to be, picked out; they have no particular rule for judging when they are sufficiently dry—it is learnt by experience. When they happen to get rain while drying, the stalks become black or rusty-looking, instead of being of a bright light brown."

After seeing and inquiring into the various practices followed in the manufacture of sherries, Mr. Busby offers these opinions, in a letter to a friend.

"I have been thinking a good deal about the Sherry wines, and there are some points on which I have not been able to satisfy myself. You know we no sooner had the practice of returning the scum upon the wine, by means of a funnel, pointed out to us by Mr. Domecq, than we condemned it. It has occurred to me, that after all, it may in most cases be the best thing they could do. It is the saccharine principle that is undoubtedly most abundant in the grapes of these climates, and the imperfect fermentation which takes place in a butt, may require to be carried forward by the addition of the yeast, which, were it not for the funnel, would escape. I think Cormack used the expression, that it was to feed the wine that the scum was returned. In this I have no doubt he was correct. On the other hand, it seems to be agreed that a good deal of the Sherry, even of the albarizas, turns sour. This might undoubtedly be prevented by a contrary arrangement to the above. I think Domecq said, that sometimes 100 butts of the Machar Nudo wine would turn sour in one season. I wish you would ask him whether there has been an instance of any of his wine turning sour since he adopted the practice of allowing the scum to escape. Perhaps there are particular kinds of grapes in the vineyard which yield a wine without body. Perhaps particular parts of the soil do not bring the grapes to perfection. You will see from Chaptal what a difference there frequently exists in France in the value of the produce of two sides of the same hill. It was a question I always forgot, or neglected to put, at Xeres, whether the difference of exposure was found to affect the quality of the wine. I suspect all these things have been overlooked."

It was necessary to be very careful as to the style of packing the vine plants and cuttings for such a long voyage, and preserving them through the various climates they had to encounter in their carriage to New South Wales. At Tarascon, from Messrs. Audibert, who are nurserymen, the author learned the following method, which to most horticulturists and botanists in this country is entirely new, and by means of which the packages arrived in excellent condition at Sydney.

"Having, according to the advice of M. Delisle, consulted Messrs. Audibert respecting the packing of the plants, he expressed his fear that without moss they would soon all die; for the north wind, he observed, caused dryness as much as the heat; his brother was accordingly kind enough to accompany me to the town, with a man who carried a bag of moss. The plants were unpacked, and the boxes lined with double oiled paper, to prevent the access of air, and the escape of humidity. The moss, after having been slightly watered, was stuffed in at the ends of each bundle of plants. The latter were then replaced, and the cases closed. This is the mode adopted by Messrs. Audibert in sending vine plants to Russia, and other countries of Europe; and they were of opinion that this would be sufficient to protect the vines till their arrival within the tropics, when the warm weather would cause them to shoot, and it would therefore become desirable to sustain the shoots a little by the admixture of earth or sand among the cuttings."

In an account of Hermitage wines, the white, which is said to be without question the finest of that colour of any in France, will keep for 100 years, improving as it gets older, and when old acquiring a similarity to the white wines of Spain. The greatest part of the finest growth of red hermitage is sent to Bourdeaux to mix with the first growths of claret. The labour bestowed upon the Hermitage vineyards is immense.

"According to M. Machon, on their first plantation, and every time the plantation is renewed, the soil is dug to the depth of $4\frac{1}{2}$ or 5 feet. In most places it is also supported by terraces. This was the first place, in the course of my journey, in which I observed any supports given to the vines, but these

were simply a stake of about five feet in height to each plant, and the shoots were tied together at its top; far from the care indicated by the small trellis of the Medoc vineyards, this part of the labour seemed to be performed in the rudest possible manner. M. Machon informed me that the vines require constant attention to keep them in bearing, and whenever a vine is observed to be weak, or to yield a poor crop, it is dug out, and its place supplied by a *provin* from the strongest vine in its neighbourhood. I saw this operation commenced and completed. A vine which appeared weaker than the rest was dug out, and a trench of about two or two and a half feet deep, was opened up between it and the nearest vine in the adjoining row. This vine bore three vigorous shoots; the stock was carefully bent down till it was laid flat along the bottom of the trench; a quantity of dung was next put over it, and then some soil; of the three shoots, the least favourable from its inclination was cut off, one of the two remaining was bent back to the original position of the stock, and there fixed by the covering in of the soil; the other, in like manner, was bent in the opposite direction to fill the place of the plant which was dug out. It is evident that this is a very different process from that of filling a vacant space by bending the shoot of an adjoining vine into the ground till it issues at the place where it is intended to grow, and afterwards, when it has acquired sufficient strength, cutting off its connection with the original; the stock actually became the root of two distinct vines, and their connection is never destroyed. This process had taken place with a considerable portion of the vines this season, and a portion of them are annually treated thus:—Into each trench was put rather a large basket full of stable dung, mixed with soil. On my expressing great surprise that dung should be used at all in a vineyard of such reputation, as I had always understood, that though it added to the quantity of the wine, it injured its quality, and often gave it a bad flavour, the proprietor said, that without frequent and strong manuring the vines would scarcely yield any thing; and that provided horse or sheep dung only were used, there was no danger of its giving the wine a bad flavour, though the contrary was the case if the dung of cows, and still more that of pigs, were made use of. M. Machon gave me twelve cuttings, the number I requested, of each of the three varieties of vines. He strictly charged the vigneron to select them from young vines; he said it was with the greatest difficulty they could get the vines to last thirty years, and they would not last more than half of that time, if they were not taken from young vines, that is, from vines of five or six years.

The vines of Hermitage are planted at the distance of only 2½ feet from each other and are pruned differently from any I have before observed. They are not anxious to keep the stocks low, as in the south, but many of the older among them are 18 inches, or two feet in height. In general there is only one mother branch, and one shoot only (very seldom two) is pruned to yield the shoots of the season; on this shoot are left from 3 to 8 buds, according to its strength, and from 8 to 10 bunches is the average produce of each vine. However loosely the bearing wood of the season appeared to be tied up in a tuft at the top of the stake, M. Machon showed me that the portion which had been left of the last year's wood was carefully bent down in a circular form, and thus fixed to the stake. This, he said, was to prevent the sap from shooting up with too great force to the top. The average produce of M. Machon's vineyards is from 10 to 12 casks of about 50 gallons per hectare; that is, from 210 to 260 gallons per English acre. The soil appeared to be of great depth, and full of small stones and gravel, but still there was every where a large proportion of good vegetable mould. An observation made by Machon was, that the wines of granitic soils soon acquired their maturity, and were in general very pleasant wines for the consumption of the country where they grew, but seldom kept well."

Champagne is generally sent to the consumer at the age of three or four years, but after the first winter it is all put in bottle. Not only are there different qualities required, but also different descriptions, to suit the varying tastes of their customers in England, America, and Russia.

"A gentleman, with whom I travelled, told me that he could buy very good sound Champagne at Chalons for two francs a bottle, and was then going to purchase 100 bottles at that price, but respectable wine merchants never send any to England under three francs a bottle. What is sent to England is more spirituous, and froths more strongly than what is sold for domestic consumption. The greatest and most minute attentions are necessary in preparing Champagne. The casks in which it ferments, after running from the press, are previously sulphured to prevent the fermentation from proceeding to too great a length. It is twice clarified during the winter, and in the month of March, before the return of spring has renewed the fermentation, it is bottled off. When in this state the bottles are placed in frames diagonally, with their heads downwards. The lees are thus collected in the neck of the bottle, but they do not consider it necessary to uncork the bottles as soon as the wine is perfectly clear, nor is it considered that there is any danger of the wine spoiling if the return of warm weather should cause a re-commencement of the fermentation, and re-mix the lees through the wine. On the contrary, they sometimes allow the lees to remain to ripen, as they term it, longer than usual. The wine, in general, remains in this state till the following winter, each bottle is then placed in a frame, and carefully uncorked. The contents of the neck of the bottle are emptied. It is filled up from another bottle of the same wine, and being re-corked, only now requires age to give it all the perfection it is capable of. It of course often happens, that the wine has either undergone less than the usual fermentation, or being stronger than usual, requires a greater fermentation before being put into bottles; and it consequently happens that the fermentation in the bottles is greater than they can bear, and that a large proportion of them burst during the first summer. The floors of the wine cellars are all covered with grooves, sloping to a gutter, by which the wine which has burst the bottles is conveyed to a cistern in the floor, and, as there is the most perfect cleanliness observed, a part of the wine is thus sometimes saved."

The author is decidedly of opinion, from his personal observations that no vineyard produces any wines of reputation which is not more or less calcareous in its soil. He only speaks of dry wines being so limited, for sweet wines of great excellence are produced in a variety of soils, and in fact owe their qualities more to the variety of the grapes and the manner in which they are treated than to the soil.

"The limited extent of the first-rate vineyards is proverbial, and writers upon the subject have almost universally concluded that it is in vain to attempt accounting for the amazing differences which are frequently observed in the produce of vineyards similar in soil, and in every other respect, and separated from each other only by a fence, or a footpath. My own observations have led me to believe, that there is more of quackery than of truth in this. In all those districts which produce wines of high reputation, some few individuals have seen the advantage of selecting a particular variety of grape, and of managing its culture so as to bring it to the highest state of perfection of which it is capable. The same care has been extended to the making, and subsequent management of their wine, by seizing the most favourable moment for the vintage—by the rapidity with which the grapes are gathered and pressed, so that the whole contents of each vat may be exactly in the same state, and a simultaneous and equal fermentation be secured throughout—by exercising equal discrimination and care in the time and manner of drawing off the wine, and in its subsequent treatment in the vats or casks where it is kept—and lastly, by not selling the wine till it should have acquired all the perfection which it could acquire from age, and by selling, as the produce of their own vineyards, only such vintages as were calculated to acquire or maintain its celebrity. By these means have the vineyards of a few individuals acquired a reputation which has enabled the pro-

prietors to command almost their own prices for their wines; and it was evidently the interest of such persons that the excellence of their wines should be imputed to a peculiarity in the soil, rather than to a system of management which others might imitate. It is evident, however, that for all this a command of capital is required, which is not often found among proprietors of vineyards; and to this cause, more than to any other, it is undoubtedly to be traced, that a few celebrated properties have acquired and maintained almost a monopoly in the production of fine wines."

It appears then, that when people speak of age, and vintages, and even of vineyards, attributing to them precise and established properties, they run the risk of speaking incorrectly. Not to mention the effects of different modes of cultivating the wine, the fancies, the tastes, the tricks of the manufacturers, produce endless varieties and shades of distinction; and Mr. Busby has done more than made this clear; he urged upon his Majesty's government the expediency of establishing an Experimental Garden at Sydney, for the sake of the colony, besides sending thither, "without any expense to the public, and almost in a complete state, a national collection of vines, which it was for three quarters of a century the favourite project of writers on agriculture and agricultural societies in France, to collect, and which was at length accomplished at a very considerable expense to the country, by the Count de Chaptal, when Minister of the Interior under Buonaparte." We do not know whether our government have followed the author's suggestion about the Sydney Experimental Garden; nevertheless, his individual exertions have been great, and it is to be hoped will be successful. If so, it will be a most gratifying result, and one that will exhibit him as an illustrious benefactor of mankind. How great must be the benefit should New South Wales be found suitable, as regards soil and climate, for the culture of but a few of the varieties sent thither by him. In such a case, it will require neither great study, nor toil, nor expense, to enable the colonists to make a good wine. In such a case too, by a little attention to a few simple principles, they may easily improve upon the practice of most old wine countries, where error has become a habit, and blind routine has been sanctioned or rather consecrated by prescription. Every emigrant to New South Wales, at least, will be culpable if, knowing that this little practical work exists, he does not make himself master of its information, and act upon it to the extent of his opportunities. There are lists appended, of the varieties of the vines obtained by the author, and described by him.

It would be wrong to overlook a testimony furnished by the author, highly creditable to the people praised. He says, that the attentions he uniformly received from the French in his journey and research, far exceeded what he expected or had a right to expect. He often reflected how ill-placed was the reserve he had been advised to use about the objects of his journey, when in the Bourdeaux country in 1822. He was then told, that if these were known, it would excite the greatest jealousy wherever he should go, and that he would be thwarted and misled in every possible way. On the present occasion however, he had no advisers, and acting upon the impulse of his own disposition, he always prefaced his request for information with a statement of the objects for which it was required. Every person was thereupon anxious to forward his undertaking. It is highly proper thus to give full credit for such friendly and enlightened conduct.

## ON THE PRESERVATION OF FRUIT-TREE BLOSSOMS.

In this country, particularly on the east coast in the northern parts of the island, it becomes one of the most important and anxious duties of the gardener to preserve those blossoms that contain the germ of our most delicious fruits from being destroyed by spring frosts and eastern cutting winds. An ancient method is still sometimes resorted to, viz. shading the trees slightly with branches of spruce fir, yew, or beech; but it is evident that unless the branches be firmly fixed, these will do more harm than all the shelter they can furnish will do good. Strong fronds of the common brake or fern have been used for this purpose; being the remains of the former year's growth, they are light and dry.

Canvass screens in moveable frames, are, however, a much more effectual and manageable protection, than any sort of branches; but the fabric must be thin, to admit light. Nicol recommends the material of which ships' flags are sometimes formed, which may be made more transparent and durable by being oiled; oiled paper has also been used in frames. These screens are kept clear of the tree, a foot at top, and about 18 inches at bottom. Sometimes the canvass is used in the form of sheets to hoist up and down. They are employed only at night or in bad weather, and chiefly from the end of March to sometime in May. The blossoms thus protected, however, it is reasonable to presume, are more tender than those that have withstood the sharp weather, and the screens should therefore be continued till all risk be over; perhaps till the leaves of the tree be pretty fully expanded, the blossoms of several of our fruit trees are not beyond the ordinary injurious effects of our climate. It seems also proper to defer putting up the frames till the blossoms be pretty well expanded; for they are not previously very apt to suffer, and in this way that delicacy which would otherwise be induced, is prevented.

In some gardens in the north, screens made of reed are projected at right angles with the wall, to the distance of ten feet, and thirty or forty feet apart, and at the same time nets wrought with straw are placed in front of the trees. Old fishing nets are sometimes employed at the distance of fifteen or eighteen inches from the tree, by means of hooked sticks, and when doubled over, they render the interstices narrower. But nets made of coarse woollen yarn, or carpet worsted, are preferable to these last, when woven very thick, and the meshes not larger than to admit the point of the finger. The aptitude of such a net to attract and concentrate moisture, and to contract, besides the bristliness of the material, shews it to be much preferable to any made of flax. Nets are a sort of screen that may be allowed to remain night and day without being removed.

Hoarfrosts falling perpendicularly, may be guarded against by a temporary coping of boards that may project a foot or eighteen inches clear of the tree at the top. Practical gardeners are, of course, aware of all these modes of sheltering the objects of their anxiety, and it may be, of many other expedients; but what we have mentioned are sufficient to shew the less skilful, but equally enthusiastic private cultivator, how one great object of his earnestness may be gone about.

## ON THE RASPBERRY.

The raspberry requires a deep light loamy soil, moderately enriched with well rotten manure. Suckers with good roots may be planted early in October, so that they may strike root before winter. If they are to be treated as bushes, they may be planted in rows at five feet apart, and four feet in the rows. It is a good plan to train raspberries against a trellis; and then they must be planted nearer or further apart, according to the height of the trellis. One of five feet is recommended, and constructed from east to west, to have the advantage of the sun. Let them be placed singly at ten inches apart, and on both sides of the trellis.

The raspberry must have both a summer and winter regulation. The first is about mid-summer or a little later; in doing which, pull up or cut clean away to inside the soil, all suckers, except about eighteen or twenty to every bush, and to as many more as will be wanted at the winter pruning against the trellis. By doing this, the fruit is improved in

size, and the shoots which are to bear next year, get well matured. Whatever shoots are produced after this regulation, let them be destroyed by pulling up, as soon as they are a foot or half a yard high.

At winter pruning, let all the shoots of the bushes which bore fruit last summer, be cut away close to the ground, and to every bush leave about eight or ten of those shoots produced last summer, cutting clean away all others; after this is done, they must be tied together, so that two bushes will form an arch; after being tied, let a few inches be cut off the ends. Of those trained against a trellis, leave as many good shoots to bear next year as will be ten inches apart, pruning a little from the ends, and then tying them to the trellis. If the plants are not very vigorous, some well rotted manure must be dug in, round the roots, but not deeper than four inches. Raspberries will bear for eight years from the time of planting, when they must be destroyed. But two years previous to this, a new plantation of them must be made in some other place, so that when the old ones are destroyed, this will be in a good bearing condition.

## HOW TO COVER NAKED BRANCHES OF FRUIT TREES WITH NEW WOOD.

The branches of fruit-trees trained against walls and espaliers, it is well known, are apt to become naked after a few years, for about a foot or two nearest the stem. This produces an unsightly appearance, whilst it is difficult to procure blossom spurs, or even wood shoots in those situations, unless by training a new shoot from the main stem, which cannot always be procured. To remedy this defect, it is mentioned in the London Horticultural Society's Transactions, by Mr. S. Street, of Penryn, Cornwall, that by interrupting the sap at a distance from the main stem, by ringing the branches, shoots might be produced between the ring and the stem. His first experiment ran thus:—When the blossom-buds were about to burst, he made a ring to the extent of one-fifth of an inch, in the usual way, at the distance of two feet from the main stem, round a branch of a Jargonelle pear-tree, trained horizontally, which branch had for several years been entirely bare both of fruit-spurs and wood-shoots; nor was there the slightest appearance of an embryo bud at the time of ringing. He soon found that a space to the extent of seven inches nearest the ring began to break into buds. In July there were six fine buds broken, and two embryo buds visible. He also ringed a branch of a Bergamot pear-tree, at six inches from the stem, which had at the same period of the summer six buds broken, and four embryos prominent. We do not learn from the account how these experiments succeeded in the following spring; but Mr. Street had no doubt of their success, and since they are of such a simple nature, they may easily be put to the test by any one. He remarks, that the space which formed the ring soon was grown over in both cases.

## DESCRIPTION OF THE PLATES.

### ÆSCULUS PAVIA.

Heptandria—Monongynia.

Nat. Ord. Acera.

Æsculus, *Lin.* *Calix* one-leaved, four to five toothed, ventricose. *Corolla* of four or five unequal pubescent petals, inserted upon the calix. *Capsule* three-celled. *Seeds* large, solitary.

Æ. Pavia, *L.*—Buck-eye. Leaves by fives, glabrous, unequally toothed; corolla four-petalled; the claws of the connivent petals as long as the calix.

Hippocastanum. *Tourn.* Castanea Equina, *Rai.* Pavia, *Boerh.* Pavia rubra, *Loud. Hort. Br.* Scarlet Horse-chesnut, *English.* Le marronier d'Inde, *French.* Die rosskastanie, *German.* Paardenkarstengeeboom, *Dutch.* L'ippocastano, *Italian.* Esculo castana de caballo, *Spanish.* Esculo, *Portuguese.* Konskoi kastan, *Russian.*

The generic name was adopted by Linnæus, and is said to be derived from the Latin word *esca, food:* a name, however, acknowledged to be very inappropriate to this genus.

"A shrub, generally, of three to five feet high, sometimes becoming a small tree; branches irregular, thick, obtuse. Flowers in terminal racemes. Petals unequal, of a bright scarlet colour. Stamens unequal, nearly as long as the petals. Capsules nearly round, coriaceous, three celled."—Flowers from April to June. It is propagated by seed or layers, but most generally by grafting. The bark is astringent and bitter; the root saponaceous, and is used as a substitute for soap in washing woollen clothes. From its narcotic property it is also used in Carolina to decoy fish. Mr. Elliott states that the tender branches are bruised and thrown into a pool of small extent, the water is then agitated until it becomes sufficiently impregnated to affect the fish; they rise to the surface almost lifeless, and may be taken by the hand. The powdered seed may be substituted with equal effect. Fish taken in this manner are eaten with impunity.

This species is also indigenous to Brazil. The genus is peculiarly American, with the exception of the Æsculus Hippocastanum of Northern Asia, and is much esteemed for the grandeur of its flowers and foilage.

### MONARDA PURPUREA.

PURPLE MOUNTAIN BALM.

Diandria—Monogynia.

Labiatæ, Juss.

Monarda: *Calix* 5-toothed, cylindric, striate. *Corolla* ringent, with a long cylindric tube, *upper* lip linear, nearly straight and entire, involving the filaments; *lower lip* reflected, broader, 3-lobed, the middle lobe longer. (*Flowers* complete, inferior, one-petalled, and naked seeds).

M. Purpurea: Purple Mountain Balm. Somewhat smooth, with large leafy heads; *bracts* large, exterior ones coloured, broad-ovate-acuminate serrated. *Calix* coloured and bearded faux. *Corolla* exserted, rather smooth. Leaves ovate-oblong, acute, distinctly serrated, nerved and pilose. Stem smooth and acute angled—*Pursh.*

M. clinopodia. Vahl. M. fistulosa v. cr. B. M. Gravel-wort, Horse-mint, Wild Bergamot, *American according to localities.*

Linn. Gen. 37. Schreb. 22. Ludw. 179. Willd. v. 1. 124. Mill. dic. v. 3. Vahl. enum. 1, p. 218. Descriptio. Juss. 111. Gærtn. t. 66. Lam. ill. t. 19. Michaux. *Pursh.* v. pp. 17 and 18. Nuttall. Bar. Big. Torr, Darl. Loud. in Encyc. and Hortus.

This genus is named in honor of Nicholas Monardes, a Spanish Botanist and Physician, who lived at Seville in the 16th century, and published many treatises relative to the natural productions of America.

This genus is particularly *American.* The *purpurea* is perennial, herbaceous, two or three feet high, flowering from July to September, in the mountainous districts of Virginia. The flowers are verticillate, or terminal and capitate, with involucrate bractes richly tinted with lilac and purple. The whole plant is remarkable for its fragrance and beauty, and may be propagated by seeds or by the division of its roots in sandy loam. The medicinal properties of the natural orders to which it belongs are those of *secernant stimulants, stomachics* and *tonics.*

### SILENE REGIA.

SPLENDID CATCH-FLY.

Decandria—Trigynia.

Caryophyllæ—Juss.

Silene. *Calix* cylindrical or conic. *Petals* 5, unguiculate, generally crowned at the orifice. *Capsule* 3 celled.

Æculus Pavia.

Monarda Purpurea.

3. Silene Regia.

4 Gentiana Saponaria.

5. Dracocephalum Denticulatum.

6. Lysimachia longifolia.

S. Regia. Splendid Catch-fly. *Stem* tall and erect; *leaves* broad-ovate, somewhat asperate; branches trichotomally floriferous; *calix* long and cylindric; *petals* generally entire; *style* and *stamina* exserted.—*Nutt.*

Viscago, Dill. and Hall. Cucubalus, Sal. Lychnis Bauh. Viscous Campion or Catch-fly, *English.* Wild Pink, *American.* Silene, *French.*—Die siline, *German.* Veld-kaars, *Dutch.* Skœlgkrands, *Danish.*

Linn. Gen. 567. Schreb. 304. Wild. v. 2. 691. Mar. Mill. v. 4.—Juss. 302. Lam. v. 7. 158. Sm. fl. br. 234 and Cyc. Loud. Mx. Ph. Nut. Ell. Bart. Big. Tor. Darl. Eat.

Silene, a name given by Linnæus to this genus, the chief of the *catch-fly* tribe, in allusion to the viscid frothy moisture of its stalks, by which flies of the smaller kind are numerously entrapped. This word is probably derived from σιαλον, *saliva.* De Theis deduces it more directly from the drunken god *Silenus*, whose name he supposes to have a similar origin.

The root perennial. Stem erect and stout, 4 or 5 feet high, much branched, joints tumid, branches rigid and erect, and as well as the whole plant pulverulently pubescent and viscid, upper leaves acuminate. Flowers large, and bright scarlet, very numerous, dichotomal and terminal. Calix conspicuously striated. Petals oblanceolate, usually entire, appendices of the orifice distinct. This species was discovered by Mr. Nuttall in America, from whom the above is taken; he further says it is the most splend.d species of the genus: it is also found near the Falls of the Potomac river. There are more than 200 species belonging to the genus, variously and unequally distributed throughout the world.

"The fell *Silene*, and her sisters fair,
Skill'd in destruction, spread the viscous snare.
The *Syren*-band *ten* lofty bravoes screen,
And, frowning, guard the magic nets unseen.
Haste, glittering nations, tenants of the air,
Oh, steer from hence your viewless course afar!
If with soft words, sweet blushes, nods and smiles,
The *three* dread Syrens lure you to their toils,
Limed by their art, in vain you point your stings,
In vain the efforts of your whirring wings!—
Go seek, your gilded mates and infant hives,
Nor taste the honey purchas'd with your lives!"—*Darwin.*

## GENTIANA SAPONARIA.

SOAP WORT GENTIAN.

Petandria—Digynia.

Gentianæ, Juss.

Gentiana. *Calix* half 5-cleft, or half 5-parted; *Carolla* monopetalous, inferior, tubulous at the base, campanulate, border 4 or 5-cleft; divisions ciliate or entire, spreading, erect, or connivent, sometimes furnished with intermediate plaits. *Stamina* 4 or 5, distinct or connate.—*Capsule* 2-valved, 1-celled, with 2 longitudinal receptacles.

This genus is supposed to be named from a king of Illyria, Gentius, who, according to Pliny, first discovered its tonic quality. The plant is perennial. Stem simple, 1-2 feet high, and with the leaves nearly glabrous. Flowers axillary and terminal, sessile, clustered. Segments of the *calix* very short, sometimes oblong, but acute. Corolla ventricose, blue. Grows along water courses. It flowers in October. When the genus was first discovered, it was used with success in the plague, that then ravaged the Illyrian army, and was considered by the ancients, as an excellent vermifuge and an antidote to poison; their properties, however, from subsequent experience place all the species, of which there are said to be one hundred and ten known, among the bitter tonics and mild cathartics. The species *lutea*, yet holds an undisputed control, as a tonic, among the articles of the *materia medica.*

## DRACOCEPHALUM DENTICULATUM.

TOOTHED DRAGON'S HEAD.

Didynamia—Gymnospermia.

Labiatæ.

Dracocephalum, *L.* *Calix* bilabiate, subequal, 5-cleft. Orifice of the *corolla* inflated; upper lip concave. *Stamina* unconnected.

D. Denticulatum, *W.* Toothed Dragon's Head. Spikes elongated, with remote flowers; bracts subulate; teeth of the calyx nearly equal; leaves ovate lanceolate, toothed above.

Dracocephalon, *Tourn.* Prasium purpureum, *Walt.* Physostegia, *Benth.* Dragon's head. Dracocephale, *French.* Der drachenkopf, *German.* Draakskop, *Dutch.* Dragocefalo, *Italian, Spanish,* and *Portuguese.* Dragehoved, *Danish.* Cay co co, *Chinese.*

The generic name is derived from the Greek words Δρακων, dragon, and κεφαλη, a head, from the large swelling form of its ringent corolla and fanciful resemblance. The plant is herbaceous and perennial. The stem one foot high, square, glabrous, and very minutely pubescent at the summit. Leaves closely sitting, oblong, and generally ovate lanceolate, rather acutely serrulate than denticulate, glabrous. Bracts about half as long as the calix, and with the calix minutely pubescent. Corolla moderately large, handsome, variegated on the lower lip, longer than the stamens. It grows in mountainous ranges from Pennsylvania to Carolina, flowering from June to September; flowers purple. It is of easy cultivation in sandy loam, or vegetable mould, and increased by seed, or by separating the roots in the spring; and deserves a place in the flower garden. Plants belonging to the natural order to which this is allied, are, for the most part, agreeably aromatic, or bitter, and none of them poisonous.

## LYSIMACHIA LONGIFOLIA.

LONG-LEAVED LOOSESTRIFE.

Pentandria Monogynia.

Lysimachiæ.

Lysimachia, *Lin.* (*Flowers monopetalous, inferior, fruit covered*). *Corolla* rotate, five-cleft. *Stigma* one. *Capsule* one-celled, globular, mucronate. five or ten valved, few or many seeded.

L. Longifolia, *Ph.*—Long-leaved Loosestrife. Stem branched, smooth; leaves opposite, sessile, linear, very long, upper ones in fours; peduncles in fours, axillary, subterminal, one flowered; segments of the corolla ovate, acuminate, serrulate.

Nummularia, *Bauh.* L. quadriflora, *Sims.* Willow-herb, Loosestrife. Lisimaque, *French.* Der gelbe weiderick, *German.* Weiderick, *Dutch,* Lisimachia, *Italian.* Lisimaquia, *Spanish.* Werbuinik, *Russian.*

A very ancient generic name, and so called, according to Pliny and others, from Lysimachus, a favourite general of Alexander the Great; while others derive it from two Greek words, meaning literally *loosestrife*, from the quality absurdly ascribed to it, by the ancients, of quieting restive oxen when put upon their yokes.

Perennial. Stem 2-3 feet high, slender, angular. Leaves of the stem about two lines broad, flat, very acute, tapering at the base, not dotted; floral leaves verticillate. Flowers mostly on the extremities of the branches, at length nodding. Segments of the calix linear-lanceolate, acuminate. Corolla a third longer than the calix, abruptly acuminate, crenate. Stamens sub-equal, with intermediate teeth; anthers oblong. Capsule five-valved, many seeded. This species grows in wet woods, near ponds, from Pennsylvania to Georgia; and flowers from June to August. A mild tonic is the property of the natural order to which this genus belongs. It may be easily cultivated in common garden soil.

## DODECATHEON MEADIA.

AMERICAN COWSLIP.

Pentandria Monogynia.

Lysimachiæ, Juss.

Dodecatheon. (*Flowers monopetalous, inferior, fruit covered*). *Calix* 5-cleft. *Corolla* rotate, reflected, 5-cleft. *Stamina* seated in the tube. *Stigma* obtuse. *Capsule* 1-celled, oblong, opening at the apex.

D. Meadia—American Cowslip. *Leaves* oblong-oval, repandly toothed; *umbel* many-flowered, lax; *bracts* oval.

Meadia, *Cates.* American Cowslip. Gyroselle de Virginie, *French.* Primula Americana, *Spanish.* Diegottergabe, *German.* Afgodskruid, *Dutch.*

Cat. car. v. 1. Lin. Gen. 81. Schreb. 107. Willd. sp. pl. v. 1, 808. Juss. 97. Gærtn. t. 50. Mart. Mill. Dic. v. 2. Smith in Rees' Cyclop. art. Dodec. Michaux. Pursh., Nuttall, Torrey, and James.

The name of this elegant plant is derived from two Greek words, meaning *twelve* and *a divinity*, a name of the Romans, signifying twelve gods or divinities, applied with singular absurdity by Linnæus to a plant, a native of a world the Romans did not know, and resembling in no particular that of their writers. It was originally named Meadia by Mark Catesby, in honour of Doctor Mead, but the name was continued only as a specific appellation by Linnæus.

This beautiful plant is peculiarly indigenous to North America; it is found on river sides, in rocky shaded situations. It is perennial; flowers in May; the flowers are pale purple and extremely beautiful. Being hardy, it is easily cultivated by the removal of its roots, or by seeds, in a light rich mould, and will repay the taste of the cultivator, while in the floral season, by its delicate exhibition. The eloquent author of the Botanic Garden, in his "Loves of the Plants," chaunts the following characteristic strain under its former name:—

> "Meadia's soft chains *five* suppliant beaux confess,
> And hand in hand the laughing belle address;
> Alike to all, she bows with wanton air,
> Rolls her dark eye, and waves her golden hair."

Our plant is one of that interesting tribe esteemed by naturalists as approaching so near to a "sui generis; there being but one other known species, viz. the *D. integrifolium*, but of a diminished size, whose habitat is peculiar to more alpine regions, and particularly among the elevated ranges of the Alleghany Mountains.

We are not aware of its having been employed in medicine or the arts, but from its natural affinities it must evidently be possessed of the qualities of a mild tonic and astringent, and that of a secernant stimulant.

## STACHYS ASPERA.

ROUGH HEDGE-NETTLE.

Didynamia Gymnospermia.

Labiatæ.

Stachys, *Lin.* *Calix* 5-cleft, awned. Upper lip of the *corolla* vaulted; the lower reflected at the sides, with the intermediate segment larger and emarginated. *Stamina* at length reflected to the sides.

S. Aspera, *Mx.*—Rough Hedge-nettle. *Stem* nearly smooth, angles only somewhat retrorsely aculeate; *leaves* oblong-lanceolate, acuminate, serrate, shortly petiolate and very smooth; *verticills* about six-flowered; *calix* divaricate, spinescent.

S. tenuifolia, *Willd.* S. arvensis, *Walt.* Woundwort. Stachyde, *French.* Die rossnessel, *German.* Andoorn, *Dutch.* Stachi, *Italian.* Estaquis, *Spanish.*

Stem, one and a half to two feet high, square, the angles fringed with retrorse bristles. Leaves long, narrow, sessile, acute, finely serrulate, the margin fringed, and the veins sprinkled with short acute bristles. Flowers generally six in a whorl. Teeth of the calix very acute, somewhat divergent and with the angles fringed with short bristles. Corolla much longer than calix, purplish. Stamens as long as the corolla. Perennial; when in full flower very handsome. Grows in low fields and on banks of rivers, from New England to Carolina, and flowering from June to August. Propagated by seeds and division of the plant in common garden soil.

## VIOLA PUBESCENS.

DOWNY VIOLET.

Pentandria—Monogynia.

Cisti, Jus.—Violacæ, Ven.

Viola, *Lin.* *Calix* deeply five-cleft, produced at the base. *Corolla* five-petalled, irregular; upper petal corniculate at the base. *Anthers* connivent, cohering. *Capsule* one-celled, three-valved.

V. Pubescens, *Ait.*—Downy Violet. Villous pubescent; stem erect, naked below; leaves broad-cordate, toothed; stipules ovate, subdentate.

Viola pennsylvanica, *Mich.* Pansy or Heart's-ease. Violette de Mars, *French.* Das margveilchen, *German.* Tamme viool, *Dutch.* Viola marzia, *Italian.* Violeta, *Spanish.* Pachutschaja fialko, *Russian.* Marts fioler. *Danish.* Akta fioler, *Swedish.* Kiet tuong hoa, *Chinese.*

The derivation of this very common name, Viola, is involved in much obscurity; but is believed to have been synonymous with the word flower: Ιον, its Greek name, is fancifully supposed, by some, to be derived from its having served as food for the metamorphosed Io; while others derive it from Ionia, the country in which it was first known.

Stem simple, six to eight inches high, with one or two oblong amplexicaul bracts towards the base. Leaves large, two or three on the upper part of the stem, soft, pubescent on both sides, more or less acuminate; petioles short. Stipules ovate-oblong, discoloured, a little toothed, particularly towards the summit. Peduncles shorter than the leaves; bracts subulate, very minute. Flower middle sized, yellow; lateral petals bearded with white, and, as well as the lower one, handsomely striate; spur short, gibbous, acuminate. Segments of the calix lanceolate. Stigma globose, pubescent. Capsule smooth. It is perennial; inhabiting shady woods, among rocks, and flowering from April to June. All the species can be increased by seed and division of the roots in common garden soil.

The medicinal properties of the natural order, are found principally in their roots, which are said to be, in all cases, emetics, in a greater or less degree. A syrup made from the flowers, of the species odorata, has long been an officinal preparation; but is chiefly valued, by chemists, as a delicate test to detect an acid or an alkali, and, for this purpose, is cultivated largely in Europe.

## IRIS CRISTATA.

LADIES' CALAMAS.

Triandria—Monogynia.

Irides—Juss.

Iris. (*Flowers superior, incomplete*). *Corolla* 6-parted, large; three of the lamina erect; the other three reflected, with or without a crest or beard on the inner side, and bearing the stamina at their base. *Style* short; *stigmata* 3 petaloid, oblong, large, usually arched. *Stamina* incumbent, covered by the stigmata. *Capsule* 3-celled, 3-valved, many seeded. *Seeds* flat, triangular; (in some species nearly round or spherical).

Iris, a name given by Theophrastus, and the elder botanists from the variety and brilliancy of its colours. Root creeping. Stem compressed, two to four inches high, clothed at base with ensiform leaves, exterior petals oblong, obtuse, entire, pale blue, yellow in the middle, with three longitudinal, undulated crests, instead of a beard; interior petals a little narrower, entirely blue. Filaments and Anthers pale yellow. Stigmas pale blue, shorter than the petals. It is perennial; and flowers from February to May; it is found on the banks of rivers in rocky situations. The roots, of this species, when chewed, are very remarkable; they at first occasion a pleasant sweet taste, which in a few minutes turns to a burning sensation, by far more pungent than Capsicum.

7. Dodecotheon Media

8. Stachys Aspera.

9. Viola Pubescens.

10. Iris Cristata.

## ON THE FORMATION OF A GARDEN.

In a former number of our Magazine we have given a sketch of the history, principles, and materials of landscape gardening. We now proceed to throw together some generally acccpted rules in this country, as to the formation of a garden, using the term garden in its usual meaning.

The consideration of the position of a garden, in relation to the mansion-house, properly belongs to the subject of landscape gardening. It has, however, we may here remark, become fashionable to place the fruit and kitchen garden at a considerable distance from the house. The point principally had in view in this arrangement, is to keep the garden walls concealed from the sight of persons within the house, which may generally be compassed by the intervention of shrubs and low growing trees. If, therefore, there be an access to the garden quite distinct from the principal approach to the house, many other circumstances may unite to control any general fashion as to the position of the garden. Some of these circumstances we shall now notice.

Every one is sensible that *shelter* in our climate is a primary object in gardening. Natural slopes may be taken advantage of in this respect, such as gentle declivities with a south or south-west exposure, at the bases of hills, or sloping banks of rivers with an exposure. Plantations will also often suggest a situation for a garden as well as house; allowance being made for the size and character of the adjacent trees, so that they do no injury by their shade. It has been ascertained that hoar frost, if gradually dissolved by the early morning beams of the sun, does little or no injury, but if the powerful rays of the advanced sun come all at once upon the hoar-clad plants and flowers, they are often destructive. Any trees that obstruct the morning sun, are therefore to be kept at a distance, as well as those that break the sun-beams in winter or early spring, when every glimpse is so valuable. In the direction from which cold and violent winds come, the shelter should be much nearer. But forest trees may not previously exist, and in that case screen plantations must be reared as fast as possible. The sycamore, the larch, the spruce, and balm of gilead firs, are all fast growing trees, and therefore particularly suited to become screens in naked spots.

*Water* is a valuable appendix to a garden. If it can be commanded in the shape of a streamlet, this will save the expense of having it conveyed by pipes from the adjacent fountains, or rivers. Running water is always preferable on account of its softness, but ponds must be had recourse to in its absence, since the water thus exposed to sun and air becomes fit for the nourishment of plants. Convenience and amenity are the uses of water to a garden.

*Walls* are absolutely necessary in this country for the ripening of certain fruits, as well as for shelter. The north wall is the highest, the south wall the lowest, and those on the other two sides of a medium height. Walls higher than twelve or fourteen feet are necessary only for pear trees. It is evident that the terms south and north walls, here denote the south and north sides of a garden, but that when speaking of a south wall for fruit, it means a north wall with a south aspect. Many are of opinion, that the best aspect in this country for a fine fruit, is about one point to the eastward of the south, such enjoying the morning sun, and avoiding the west and south-west winds. The south-west and west walls are fitted for cherries, many kinds of pears and apples; the north wall for pears and apples for baking.

Bricks are the best materials for the construction of garden walls. Sandstone which rises in flags is the best substitute. Both of these materials admit of branches being nailed regularly to them. Where the walls are of common stone, a trellis of spars should be placed against them, to which the branches are tied. Some have constructed as a basement to garden walls, a series of arches, these arches having their tops on a level with the surface of the borders. Thus, not only is much building avoided, but the roots of the wall trees planted opposite the openings are allowed to extend themselves in every direction. The basement, whether of brick or stone, should always be about six inches thicker than the low part of the wall. Curved walls, or such as are inclined to the horizon are not judicious plans. There should be a coping, however, on every such erection, the best being formed of long pieces of freestone, the edges projecting two or three inches, and a groove being run underneath the plinth, to collect and throw off the drops of rain that collect.

If the enclosing walls afford too little room for training fruit trees upon, one or two cross walls may be run athwart the garden, keeping at least one hundred feet between any two. These seldom require to be high. Fruit trees are planted on both sides of a wall, the exterior fruit border being generally defended by a sunk fence and an evergreen hedge, with a wire fence, for the exclusion of hares.

Hot walls are of two kinds; such as are intended to have sloping glass frames attached to them, thus to a certain extent forcing the fruit; and such as are merely fitted to have screens attached to them over the blossoms in spring. In the first kind, a low parapet a foot or so high, at the distance of about five feet from the wall, is formed for the glass frames to rest on, and trees are trained on a trellis within a few inches of the wall, whilst along the border in front of the trees, early crops of peas and beans are raised. Other forms of these frames are employed, which we need not minutely describe. Flued walls, with an apparatus for temporary coverings of canvas, oiled paper, &c., are necessary for the perfect production of the finer sorts of peaches and nectarines, in all parts of Britain north of Yorkshire. The flues are commonly eighteen or twenty inches deep, and nine inches wide, inside measure, and they make as many turns as the height of the wall will permit. The front wall of the flue is four and a half inches thick or so, without any inside plastering.

*Soils* are of course of great moment in judging of the situation for a garden. In selecting the ground, the plants natural to it should be accurately noted. In every garden two varieties are wanted—a strong and a light soil; that is, a clayey loam and a sandy loam. For the general soil, a loam of middling quality, but partaking rather of the sandy than the clayey, is accounted the best. We do not enter into a nomenclature on this subject, which as yet is very imperfect, nor into the chemical properties of soils.

The soil of a garden should never be less than two feet and a half deep: three feet are preferred. The natural soil, therefore, however good, is seldom of sufficient depth. The gleanings of roads and grass turf of any kind, form valuable additions. One of the most generally desired soils is what is called *mould*, by which is meant that where vegetable earth predominates. Such as is of a bright chestnut colour is the best. Miller says, its characters are, that "it cuts like butter, does not stick obstinately, but is short, tolerably light, breaking into small clods, is sweet, well tempered, without crushing or chapping in dry weather, or turning to mortar in wet."

Nothing contributes more to the improving and preserving the soil in a good condition, than exposing it as often as possible to the action of the sun and air. If not in crop, garden ground should always be left rough, or if possible ridged up. Trenching every third year two spadesful deep is highly beneficial; for thus, the surface that has produced three crops will rest for the next three years. In the course of trenching, now and then three spadesful may be taken, so as gradually and not too rapidly to bring up and expose for melioration the sub-soil. Burning, if judiciously done, is a good method of improving cold or sour clays. But *manures* are the most general rectifiers and meliorators of land. Yet it is fully ascertained that for the greater number of culinary plants, and for all fruit-trees and flowers, composts or compound manures, are far preferable to simple dungs, and that till the latter are completely rotted they should not in any case be suffered to touch the roots of plants; even composts should not be too rich.

*Fruit-tree borders* are important points in the formation of a garden. Where peaches, nectarines, vines, and the best sorts of plums and pears are cultivated, borders should not be less than from eight to twelve feet in breadth. It is very advantageous to have them prepared a whole season before planting the trees, whether consisting of travelled soil, or of that which is natural and enriched by composts, provided the ground be repeatedly turned and ridged up. They are at first made higher by some inches above the walks, than the other parts of the garden, because they afterwards receive comparatively little that can add to their depth. In dunging the borders, a three pronged fork should be used to dig in the manure, that the roots of the trees may not be injured by the process. It is sometimes impossible to get, without an inconvenient expense, the necessary soil for the best border sorts of trees; in these cases the kinds of trees must be adapted to the soil. Engrafting and re-ingrafting, judiciously managed, will also surmount some of the evils of bad situations and soils in the borders; but this point belongs to another branch of horticulture than that which we are at present noticing. The borders, particularly those next the south walls, are generally cropped with early peas or turnips, avoiding such plants as extend their roots into the earth. But many gardeners, especially in the case of peach and nectarine borders, disapprove of every sort of crop but the very lightest, such as salad herbs.

The *division* of the garden is conducted according to general rules also. The wall-tree borders extending all around the margin of the garden, it naturally follows that a gravel walk should run parallel with them; on the other side of this walk, there is in many instances a row of espalier trees, fixed to trellis-rails; the centre of the garden is traversed by a broad walk. Cross walls of course alter this arrangement, and a main walk, proceeding directly to the doors in the centre of the cross walls, the rest of the garden is divided into compartments, and these compartments are laid out in beds four feet wide, with narrow alleys. For currant and other bushes, the quarters are of course undivided; and narrow beds are unnecessary in the case of large perennial plants. Border-edgings are only used for the walks next the walls and the crop walks; in the interior quarters, however, parsley, or other culinary crops may sometimes be adopted as an edging.

The hot-houses form frequently a considerable part of the south wall, and all the rubbish and unsightly articles and implements are kept behind them and out of view. Sometimes all the forcing houses are in one range; but generally the pine stove and succession pit, being of different dimensions, are placed separately. Sometimes the hot-houses are disposed in a different manner, the several kinds being detached from one another, each being set down as it were in a separate grass lawn, the back part concealed by shrubs, so that the houses seem to stand in a little thicket, and thus form an agreeable variety with clumps and patches of trees in the park. In many cases the flower garden too is separated from the fruit and kitchen garden merely by a wall, or perhaps a thick-set hedge. In modern arrangements, however, it is removed from the other by a considerable distance, and to it belongs the green-house and the orangery, and sometimes a conservatory, as also a stove merely for the keeping of tender exotics.

*Hedges*, when tall and thick, afford shelter, or screen objects from view. Some sorts of shrubs and trees are preferred for their speedy growth, others for their beauty or for being evergreens. Holly forms an admirable hedge, but its growth is slow, and it only flourishes in clayey ground; but garden hedges of any kind are now much less frequently planted than they used to be. In our climate the fruit-garden must be surrounded with brick or stone walls, and supersedes the necessity of tall hedges generally. The flower garden, however, is still chiefly sheltered by evergreens, with rows of tall deciduous shrubs or low growing trees behind. In the interior of this sort of garden, hedges have been nearly banished, by the dislike of every thing formal.

Many other matters might be touched on connected with the prevailing taste, as regards gardens, taking the term in its limited and usual sense; but the above general views may be considered as a supplement to our previous glance at the history and principles of landscape gardening.

## GARDEN OPERATIONS FOR JUNE.

JUNE is really, in this country, what the poets represent May to be—the most lovely month of the year. Summer is commenced, and warm weather thoroughly established; yet the heat rarely arises to excess, or interrupts the enjoyment of those pleasures which the scenes of nature now afford. The trees are in their fullest dress; and a profusion of the gayest flowers is every where scattered around, which put on all their beauty just before they are cut down by the scythe or withered by the heat. Sheep-shearing is one of the earliest rural employments of this month, and is conducted with some measure of ceremony and rural dignity, being a kind of festival as well as a piece of labour.

A profusion of fragrance now arises from the fields of clover. A still more delicious odour proceeds from the leaves in blossom. In the hedges, the place of the hawthorn is supplied by the flowers of the dog-rose. Some time after, the woodbine or honeysuckle begins to blow, and this, united with the rose, gives our hedges their highest beauty and fragrance. Several kinds of corn come into ear and flower during this month; as do likewise numerous species of grass.

On the twenty-first of June happens the summer-solstice, or longest day, when there is scarcely any night; and although it is properly called midsummer, the greatest heats have not yet arrived.

### *Kitchen Garden.*

The cucumbers sown in the open ground last month should be thinned, when they begin to push out their first rough leaves, and a few more seeds may be sown for the same purpose, but the earlier in the month the better. Transplant celery for blanching. For this purpose form trenches, about a spade deep and three feet apart; lay the earth which comes out of the trenches regularly along each side; lay into each trench some well rotted dung, and dig it in; put the plants in a row along the middle of the trench, at the distance of four or five inches from one another. About a month or six weeks after they have been planted, when they have acquired the height of six or eight inches, a quantity of each should be laid about their stems, to blanch them, and prepare them for the table; this should be done during dry weather, and repeated once a fortnight, or according as the plants advance in growth, till they are blanched to the height of a foot or fifteen inches. The earlier sown celery will be fit for transplanting about the beginning of the month; the later sown, about the end.

About the latter end of the month, transplant endive for blanching; which should be planted out in rows, a foot apart, and at the same distance from one another in the row. Some endive seed should be sown for a principal crop; the green curled is commonly used for this purpose, because it is least apt to be injured by rain or cold. The cauliflower, broccoli, and borecole plants which were sown last month should be planted out at the distance of about three inches from one another, into beds where they may remain to acquire strength to fit them for final transplantation in July. Some of the early cauliflower plants which have formed good heads, should be allowed to stand for seed, which will ripen in September.

About the middle of this month is the best season for sowing a principal crop of turnips; the different kinds commonly sown are the yellow, white Dutch, round white, stone-turnip, Swedish, black Russian, small French round. The large white Norfolk, green-topped and red-topped, are chiefly used for field culture. Plant out leeks in rows nine inches asunder, and about six inches from one another in the row; it is a usual practice to trim off the extremities of their leaves and of their roots before they are planted. Plant out pot-herbs, such as thyme, savory,

sweet marjoram, and hyssop; likewise angelica, marygolds, clary, &c. A rainy or dull day should be chosen, and the plants put in at the distance of six inches from one another. Occasional watering will be necessary, till they have taken root. Cuttings or slips of sage, hyssop, rue, rosemary, lavender, &c., may be planted in a shady situation, and occasionally watered.

*Fruit Garden.*

Wall-trees and vines in the vineyard require the same attention this month that they did during May. When plantations of strawberries are wanted, the young plants that are produced at the joints of the runners, and that are furnished with good roots, may be taken up about the end of this month, and planted in a shady border at the distance of about six inches from one another; by September they will be fit to be planted out at the distance of a foot or fifteen inches from each other.

*Flower Garden or Pleasure Ground.*

The roots of hyacinths, jonquils, ranunculuses, &c., should be taken up after their stalks begin to decay, dried and preserved till planting-season; the roots of narcissus, crocus, snowdrops, &c., may likewise be taken up and separated, and either planted again immediately, or kept till autumn. Take up also autumnal flowering bulbs, such as colchicum, natural crocuses, narcissus, Guernsey and Belladona lilies, cyclamens, &c.; take off the offsets, and plant them again immediately or keep them till next month.

Perennial plants, such as double scarlet lychnis, double rocket, &c., may be propagated by cuttings of their stalks; each cutting should consist of three or four joints, two of which, or more than one half the length of the cutting, should be inserted into the ground. They may be either planted into a shady border, three or four inches apart, or more closely together, and covered with bell or hand-glasses. Propagate carnations, pinks, and double sweet-williams by layers. Select young shoots about five or six inches long for this purpose; strip off the leaves from the lower part of the stalks, and trim off the tops of those placed at its extremity; make a slanting cut with a sharp knife on the under part of the stalk, which should commence at a joint near the middle of the shoot, and extend upwards almost half way to the next; make a hole in the earth about an inch or an inch and a half deep, immediately under the shoot, for its reception; fix it down with a small hooked stick, and cover it with earth, except an inch or two at its extremity. A little water should be given in dry weather, which will make the layers strike root more readily. Pinks and carnations may likewise be propagated by cuttings or pipings. These pipings are formed of the extremities of the young shoots, taken off immediately under the third joint, which should be inserted into light earth almost to their tops, the extremities of their leaves being previously trimmed off. They should receive a little water to make the earth settle closely about them, and should be covered with a bell or hand-glass. The earth is sometimes rendered quite wet, and reduced to a state resembling mortar, before the pipings are introduced.

About the end of this month, hedges should receive their first clipping.

*Nursery.*

Near the close of the month, peaches, nectarines, apricots, and roses may be inoculated. The method of performing this operation is as follows: with a budding knife, which resembles a penknife with a flat handle, make a horizontal cut at some smooth part quite through the bark of the stock, from the middle of which make a perpendicular cut downwards, about two inches in length, so as to form a figure resembling the letter T. Take a young shoot of the tree, with which you intend to inoculate; cut off the leaves from its lower extremity, leaving a small part of the footstalk of each; then, about an inch under the lowest bud, make a cross cut in the shoot, almost half-way through, with the knife slanting upwards, and with a clean cut; bring it out about half an inch above the bud, detaching part both of the wood and bark containing the bud. Separate the small piece of the wood which was taken off along with the bud from the bark, which is readily done with your knife, placing the point of it between the bark and wood at one end; then examine the inside of the bark, to see if the internal eye of the bud be left; for if there appears a small hole, the eye is gone with the wood, and the bud becomes useless; but if no hole appears, the bud is good, and may be inserted into the stock, by raising the bark with the handle of the budding knife, on each side of the perpendicular cut, immediately under the cross cut. If the piece of bark which contained the bud be too long for the incision made in the stock, it should be reduced to a proper length with the knife, and introduced between the bark and wood of the stock, placing it so as to make the bud project through the perpendicular cut. Having fixed the bud, and placed the bark of the stock closely about it, put a bandage of mat, which should be previously steeped in water to increase its tenacity, round the stock, and which should extend from a little below to a little above the incision; taking care that none of the folds of the bandage cover the bud. In three weeks or a month after the inoculation has been performed, the buds will have united with the stock, which is discoverable by the bud appearing plump; the bandages should then be removed; for, were they to remain, they would cramp the buds and injure them. The incisions should be made in the stocks about six inches above ground, when dwarf trees are wanted; and at the height of six feet, when standards are to be inoculated. The buds remain dormant, and require no further attention till next spring. When they begin to push out, the heads of the stalks should be cut off.

If any of the trees that were budded last summer, or engrafted last spring, have made very vigorous shoots, stakes should be fixed to the ground, close to the stocks, to which both the stocks and shoots must be fixed. Propagate both deciduous and evergreen shrubs by layers, particularly such as do not push out roots freely, except from the new wood.

*Green-house and Hot-house.*

If the green-house plants were not placed in the open air last month, on account of the coldness of the weather, they may now be safely trusted out. These plants may be propagated this month by cuttings, layers, inarching, &c.

Hot-house plants may likewise be propagated now, and should receive a plentiful allowance of air and water. Pine apple plants which are approaching to maturity, should be sparingly watered, because too much water injures the flavour of the fruit.

## BUCKINGHAMSHIRE.

This county is bounded, on the north-west and north, by Northamptonshire; on the west by Oxfordshire; on the south by Berkshire, and on the east by Bedfordshire and Hertfordshire, and in a part by Middlesex; the southernmost part, which ends in a point, approaching to within twelve or fourteen miles of London. The figure of Buckinghamshire approaches to that of a crescent, but its outline is rendered very irregular by projections and indentations. In length it is about 50 miles, its greatest breadth 22, amounting to about 730 square miles, or 470,000 statute acres, including roads, rivers, and sites of towns.

The southern part of Buckinghamshire, beyond the Thames, is principally occupied by the Chiltern Hills. The soil there is chalk, intermixed with flints. They stretch across the country from Bedfordshire to Oxfordshire, forming a part of that great chain which extends from Norfolk to Dorsetshire. On the west side of the county, adjoining to Oxfordshire, is a range of hills of calcareous stone. In that part of the county which borders on Bedfordshire, about Wavendon,

Broughton, and the Brick Hills, the soil is a deep sand. The vale of Aylesbury, of proverbial fertility, which lies under the Chiltern Hills, and occupies the middle of the county, is formed of a rich black loam, on a calcareous subsoil. In the northern parts, the soil is chiefly clay. The whole of the Chiltern district is said formerly to have been a forest; the western part, occupied by the forest of Bernwood, was disforested in the reign of James I. At present the chief woodlands lay to the south of the Chiltern Hills. On a tract of land, extending across the parish of Little Kimble into that of Great Kimble, there are about 100 acres of box-wood, apparently the natural growth of the soil. The black cherry abounds in the neighbourhood of Chesham. The prevailing timber in the southern part of the county is beech; one wood of which, in the parish of Wycombe, is said to contain 700 acres; and nearly one-sixth part of the land between the road to Oxford and the Thames, is supposed to be covered with this wood. Whaddon Chace is the principal woodland in the northern district, containing 2,200 acres of coppices.

The practice of lopping and shrouding trees abounds so much in some parts of Buckinghamshire, as to give a very unsightly appearance to the country, and is undoubtedly very injurious to the trees. This practice arises sometimes from agreement between landlord and tenant, and sometimes by connivance. The protection and care of timber must ever be an important branch of rural economy, and nothing seems clearer than that as soon as a tree begins to decrease in its annual growth, it ought to be cut down. The Buckinghamshire wholesale style of lopping must be a fallacious attempt to reinvigorate the trees subject to such a severe measure.

The rivers of note are the Ouse and the Thames; the former enters Buckinghamshire on the west side, near Water Stratford, which it passes, and then flows in a devious course to Buckingham; thence winding to the north through a rich tract of meadow land, it reaches Stoney Stratford, Newport Pagnell, and Olney; soon afterwards turning suddenly to the east, it leaves the county near Brayfield. One of the most considerable streams of the Thames, rises near the borders of the county, in Hertfordshire; and flowing through the vale of Aylesbury, from east to west, receives the waters of several smaller streams, and enters Oxfordshire near the village of Ickford; its course through Buckinghamshire is about thirty miles. The Grand Junction Canal enters the county near Woolverton, and running eastward goes within a mile of Newport Pagnell; thence flowing to the south, it passes Fenny Stratford, Stoke-Hammond, Cinslade, and Ivinghoe, into Hertfordshire; and by means of subsidiary cuts, the coal districts in connection with London, are enabled to disperse their fuel abundantly over this inland county. On the borders of Bedfordshire are the celebrated fuller's-earth pits, one of which is now only occasionally worked. Mr. Pennant thus describes the strata: "The beds over the marl are, first, several layers of reddish sand to the thickness of six yards; then succeeds a stratum of sandstone, of the same colour, beneath which, for seven or eight yards more, the sand is again continued to the fuller's-earth, the upper part of which being impure or mixed with sand flung aside, the rest is taken up for use. The earth lies in layers, under which is a bed of rough white freestone, and under that sand beyond which the labourers have never penetrated." A striated species of *Nautilus* is found in great abundance, and frequently of a very large size, in the yellow limestone near Dinton. The only very rare plant known to the Botanist as indigenous to this county is the *Dentaria bulbifera,* which grows abundantly in its south-east corner. The great snail or *Pomatia*, Mr. Pennant was informed, is found in the woods near Gothurst, and he regards this as its most southern residence in England. It has been found, however, near Ashstead in Surry, and the tradition there, as in Buckinghamshire, is, that it was introduced from abroad for medicinal purposes.

Formerly, the commons, common fields, and wastes, in this county, bore a very large proportion to the whole of its area; but now the whole extent is very inconsiderable, except in the vale of Aylesbury, where the common fields are still numerous. Between the 1st of Queen Anne and the year 1797, there were thirty-one inclosure acts passed for this county, comprehending 38,457 acres, besides twenty-two acts in which the number of acres was not specified; and during the first forty years of George Third's reign, there were sixty-one acts of enclosure passed. Though the soil be in general poor, and the climate bleak, by assiduous cultivation it produces moderate crops of barley and wheat, and feeds both sheep and cattle. "Buckinghamshire bread and beef" was an old proverb. As far back as the time of Camden, numerous flocks of sheep were fed in the vale of Aylesbury, which yielded great profit from their wool; and Fuller says, that in his time (1660) the largest sheep in England were bred in this vale, and that it was not unusual to give 10*l.* or more for a ram. At present this vale is principally employed in feeding oxen for the Smithfield market, and in furnishing immense quantities of butter to the London dealers. Eight pounds is the average weight of butter stated to be produced weekly, from each cow in summer, and six the average in winter. In the northern parts of the county, great numbers of calves are bred, which are purchased at Aylesbury market, by the farmers of the Chiltern district, and by them fattened for the markets of the metropolis. The skim and butter-milk of the dairies are employed in fattening vast numbers of swine. There is a very small proportion of arable land in the northern division of the county; and not much in any other quarter except the Chiltern districts. In the neighbourhood of Aylesbury they are famous for rearing ducks, very early in spring, and sometimes by Christmas, which bring a high price in London. The ducks are prevented from laying by artificial means, till October or November. A few weeks before they lay, they are fed highly: the eggs are hatched by hens, which are frequently exhausted to death by sitting on three broods successively. As soon as the ducklings break the shell, they are nursed with particular care at the side of a fire.

The author of the General View of the Agriculture of Buckinghamshire, whose work was published in 1813, says, "It is a strange prejudice which pervades this county, that no plough can be used without three, four, and in some instances seven horses." Again, "In the tillage of open fields, with which the eye of the beholder is continually distressed on account of the great waste of land in the mere balks, the irregularity in ploughing, and the height of the middle or crowns of the ridges, raised very often more than two feet above the level of the furrows between them, little can be done as to correction." This state of tillage is not confined, he tells us, to open-field culture. We certainly cannot conceive that either expert ploughmen, spirited improvers, or beautiful farming, can exist where such practices and appearances maintain a hold.

The tenures of this county are various, and too much land is under the *worst kind* for improving its agriculture. The freehold estates are the same as in all other counties, and would undoubtedly wear a different appearance, were tenants properly encouraged by leases. The copyholds are, some of inheritance, others for lives. Of the former, many are subject to an arbitrary fine, not exceeding however, in any case, two years' rent; this is commonly upon alienation a fine of one year and a half's rent, and sometimes less. Others are only subject to a fine certain, or that fixed by custom, and generally about two years' quit rent; and in some cases a certain sum per acre, perhaps a sixpence, with one shilling for a house. In general, in such cases of copyhold, the lord of the manor is compellable to renew, and cannot take more than two years' improved rent. There are two other kinds of tenure, by no means uncommon in Buckinghamshire—they are leasehold estates, held upon lives renewable at the end of any of them; or upon leases for twenty-one years, renewable at the end of seven. But in saying renewable, reference to the parties themselves must be taken into account; for there is no law or custom to oblige

either the lessor or lessee to renew, and therefore but little can be expected to take place as to improvements upon such estates. With respect to leases granted by ecclesiastical bodies, it is required by law that a certain portion of the reserved rent should be in corn, commuted for, however, by money, according to the last price of corn, when the payments become due. These tenures are not uncommon in Bucks, and have a tendency to prevent inclosures.

Some of the most magnificent seats of the nobility and gentry of this county have been suffered to go to decay, yet many remain to adorn it. The most eminent is that of Stowe, belonging to the Duke of Buckingham—celebrated for its grounds and gardens.

The manufactures are by no means considerable in number or extent. A few years ago the females were generally occupied in making pillow lace, both from thread and silk; but the improvements in machinery have enabled the people of Nottingham and other parts of the kingdom to offer a substitute in machine lace, so much cheaper and equally beautiful, that the former trade has diminished to a very insignificant matter. There are several extensive establishments for making writing paper, on the transparent streams near Wycombe. At Amersham, there are manufactories both of cotton and silk, which of late years have been extended. The chief trade of the county is that which arises from the internal navigation, by which heavy commodities, such as coals, iron, timber, and limestone, are supplied to the inhabitants.

The civil division of the county is into eight hundreds. It contains nine towns, a hundred and eighty-one parishes, and twenty-six hamlets. According to the returns of rental, under the property tax, the average rent of land by the acre, when compared with that of all England, was as 713 to 595; and was exceeded by no county except Leicester, Somerset, Warwick and Hertford. The population in 1811 was 117,650, in 1821 it was 134,068, and in 1831 it had increased to 146,529.

The most attractive object in Buckinghamshire, of a public nature, is the College at Eton, established in 1440 by the unfortunate King Henry Sixth. The number of pupils has generally amounted to between three and four hundred, with the exception of the king's scholars, mostly the sons of families of the first rank. The College is distinguished by the beauty of the valley in which it stands, the flourishing state of the endowments and the number of eminent men who have there received the first rudiments of knowledge.

*India, its State and Prospects.* By Edward Thornton, Esq. London: Parbury, Allen and Co. 1835.

THIS is an able work on the present State and Prospects of British India, and seasonably published, when the act which last year passed the legislature "for effecting an arrangement with the East India Company, and for the better government of his Majesty's Indian Territories" has created an era in the history of those possessions. The work succinctly, clearly, and forcibly discusses the questions bearing upon the various departments and relationships of Indian affairs—taking up separately among other points its political, judicial, moral, commercial, and agricultural conditions. It is the chapter on the last mentioned of these heads, that alone properly falls under our review.

The system of husbandry existing among the Indians, is of the most wretched description. Where nature has done so much, man has done scarcely anything. Let us see how this assertion is borne out by the testimony of the author, whose intimate acquaintance with the facts of the case, entitle his opinion to great weight. Take for example, what he says on the Indian culture of cotton, a produce for which the soil and climate of that country are admirably adapted, although when compared with that which is grown in America, it is an inferior article; not, he maintains, on account of natural or intrinsic inferiority, but because of the slovenly ways of the cultivators.

"The native will in all cases adopt that course which gives him the least trouble, and is attended with the smallest outlay; no prospect of increased profit is sufficient to tempt him to greater care, or a more liberal expenditure. In consequence of this apathy, the cotton of India is deteriorated in value—no care is taken to select the best varieties, nor the most favourable situations—no regard is paid to a due rotation of crops—a number of articles are grown upon the same ground and at the same time, to the injury of all—and the whole system of husbandry is of the most injudicious and perverse character. The cotton-shrub, in India an annual, in America and the Leeward Islands is triennial. It is said that the best produce is yielded in the first year, and if it be so, the practice of suffering the plants to die annually may be defensible. But nothing can justify the neglect of changing the seed—a measure of indispensable necessity, but never regarded by the Indian cultivator. The methods of cleaning and separating the cotton from the seed, are as rude and insufficient as the mode of the culture. The essential oil of the seed frequently escapes, and the cotton in consequence becomes dirty and discoloured. From this cause also it derives a tendency to become mouldy. It is further injured while in the course of transit. A large proportion of it is grown at a great distance from the place of export. It is conveyed partly by water in ill-constructed boats, insufficiently protected from the weather, and is sometimes warehoused for months at intermediate places. On its arrival, though some attempts may be made to clean it and remove the seed, they partake of the inefficiency which pervades every part of the proceedings, from the sowing of the seeds to the shipment of the wool. Finally, it is subjected to powerful screws, injudiciously worked, and all the seeds and other impurities with which it happens to be contaminated, are pressed into it. Shipped in such a state, it is rather surprising that it should bear so high a relative value, compared with the cotton of the West, than that it should fall so much below it. That great improvement may be effected by intelligence and care is obvious, but European attention and European capital are indispensable. By the application of these, there is reason to believe that the cotton of the East may be brought to rival with that of the West, and one of the most important branches of our manufacturing industry thus be rendered independent of foreign states for a supply of its raw material."

There is another agricultural article, at least it is as much so as milk can be called, that is equally neglected or injudiciously treated; and one too that is eminently calculated to engage the curiosity and study of enterprising men. We allude to the article—Silk.

"Silk-worms in India, are fed not only on the mulberry, but also on the *palma christi*, or castor-oil plant, and several kinds of the laurel tribe. The mulberry is of course the most important, and the silk produced from it of a far superior quality. The culture of this valuable tree is conducted by the natives of India in the careless manner which distinguishes all their agricultural operations. No care is taken to select the best species of plant—none to preserve it, or to obtain the largest quantity of leaf, while the worm often perishes from neglect. Yet land applied to the raising of silk yields a higher rent than if cultivated for any other purpose; and though the reputation of India silk in the European market is not high, there is an anxiety for a fuller supply, which is enhanced by increasing competition between the English and French manufacturers. Though perhaps in every point of view a less important article than cotton, it yet affords an opening for the investment of capital with a reasonable prospect of fair returns."

Tobacco, says our author, though there be no memorial of its introduction, is an exotic in India, as is evident from the fact of there being no native name for it. Its consumption is small in that country, and the quality generally bad, owing in a great measure, no doubt, to the want of capital, knowledge, and care, amongst the natives. The attempts to introduce the cultivation of tea have not as yet succeeded. Coffee seems to bid fairer.

"*Coffee.*—The cultivation of coffee in India is of recent introduction, the first plantation having been established in 1823. Coffee being a shrubbery plant, requires considerable time to bring it fairly into the market; at present, therefore, to pronounce an opinion upon the subject would be premature. Bengal is regarded by Dr. Wallich as well adapted for its growth. The Hindoos at present do not drink it though the Mahomedans do. There seems nothing improbable in the expectation that it may in time find consumers among the former class; and at all events, the taste for it is so generally diffused throughout the world, that little difficulty in finding a market need be anticipated, should an article of average quality be produced."

We do not often hear much of the timber of the East Indies: but English capital and skill may ere long bring this source of wealth into great repute.

"*Timber.*—The forests of India might be rendered of far greater importance than they have hitherto been. Dr. Wallich, who visited many parts of India with an especial view to the forests, states that they contain every description of timber in the world, or substitutes for it. The wealth derivable from this source has been in a great degree overlooked, and even the timber most necessary for the supply of the wants of the natives has been neglected. There has been a serious falling off in the supply of bamboos, the universal building material for the poorer classes in India. With regard to other timber, almost all that was near the rivers has been cut down; but the natives being ignorant of the modes employed in Europe and America for the removal of timber grown at a distance from water-carriage, there is still a large supply inaccessible to them, but which would offer little difficulty to superior skill. Capital might also be judiciously applied in establishing saw-mills in the vicinity of forests, by which the risk incurred in floating timber entire down the rivers might be avoided."

From these statements it is quite clear that the natives of India are incapable of effecting those improvements of which their country is susceptible; while it is to be hoped, that the provisions of the late act will lead European capitalists to embark in such enterprizes as will bring to light the riches of that immense and fertile country.

*A Voyage Round the World, including Travels in Africa, Asia, Australasia, America, &c. &c., from* 1827 *to* 1832. By James Holman, R.N. F.R.S. London: Smith, Elder, and Co. 1835.

A VOYAGE round the World, including Travels in Africa, Asia, Australasia, America, &c., may well be supposed to furnish abundance of materials for a variety of Reviews, and to one of a botanical character among the rest. But what will our readers think when they hear that the voyager and traveller, a few of whose notices on the vegetable kingdom we are about to lay before them, is stone blind? How is he to know any thing of trees and plants, but from the taste of their fruit, or the smell of their flowers? We answer, that he is as likely to be a judge of the vegetable world as of the animal, or any other branch of knowledge which he treats of, that belongs to the external economy and appearance of things. For example, there is no more difficulty to his describing the trees and the plants of a country or island than to his sketching the barren, the wild, or romantic scenes of nature which he has visited, and which all who are acquainted with his writings know he is well skilled in doing. The truth is that Mr. Holman is one of the most inquisitive, active, and intelligent travellers; and from his endless opportunities and resources, he has collected in the course of his peregrinations and excursions, to which he is as passionately devoted as the most clear-sighted of mankind, an amazing amount of facts and knowledge, which he has delight in communicating from the overflowings of his store.

The volume before us is the third of the series containing his voyages and travels, and embraces an account of the Cormoro Islands, Seychelles, Mauritius, Ceylon, Pondicherry, &c., and various parts of the East Indies. We shall confine ourselves at present to what he says of certain kinds of trees in Ceylon. The Cocoa-nut tree is abundant in that island, and is one of the most useful and valuable that the natives of a hot climate possess. But its nature is so generally known that we rather extract what is said of other fruits, the first of which might entice any one to undertake a very long journey but to see the tree on which it grows in all its abundance.

"With respect to food, the banana is the most valuable tree that grows, and its produce is more conducive to the indolence of the natives of tropical climates, than any other natural production. Its increase is so rapid, that, in eight or nine months after the sucker has been planted, clusters of fruit are formed, and may be gathered in seven weeks more. The tree is then cut down, and the chief sucker, which is about two-thirds of its size, bears fruit in two or three months. The banana is known to give a greater return than any other fruit in the world, as a small spot of ground will yield thousands of pounds weight annually. The bunches of fruit average 35lb. each. They are gathered green for curries, or to be dressed in any other manner as a vegetable; and, when ripe, are in general use as a fruit, which, indeed, in some countries, forms a considerable part of the food of the natives."

Mr. Holman adopts an interesting account of the cinnamon-tree and its products, given, he says, in a recent publication, and which we shall recopy. This kind of tree (Laurus Cinnamom) is indigenous in Ceylon.

"'The tree grows to the height of twenty-five or thirty feet, and the stem to a diameter of from twelve to fifteen inches. The young leaves have a scarlet-crimson colour; the bark of the shoots is often beautifully speckled with dark green and light orange colours. The leaves, when full grown, are from six to nine inches long, and from two to three broad. The flowers appear in January and February, and the seeds ripen in June, July, and August. The odour of the flowers resembles the disagreeable smell which emanates from bones when they are sawn. Unless when flowering, the tree emits no odour whatever.

"'Buffaloes, cows, goats, deer and horses, eat the leaves, and pigeons and crows swallow the berries with great avidity. By these birds the tree is disseminated to a great extent, and in the most impassable jungles; for their stomachs do not destroy the germinating qualities of the seeds.

"'There is, perhaps, no part of the world in which the cinnamon-tree grows in such abundance as in Ceylon, but even in this island it is chiefly confined to the south-west quarter. In the other parts of the island the tree is comparatively rare, and the bark is deficient in the spicy, aromatic flavour which it possesses in what has been called the 'Cinnamon Country.' In the north and north-east parts of the island the tree has never been seen. The cinnamon-tree thrives best in a rich, light, dry soil, and some degree of shelter from the ardent rays of the sun seems to be beneficial to it. Cinnamon-trees grow, or rather live, in nearly quartz sand; but they yield little cinnamon in this soil, as is the case in sandy parts of the Merandalon plantation near Colombo.'"

The principal products of the cinnamon-tree, which grows in the jungles or natural woods as well as in plantations are—

"'1st. *Cassia Buds.*—The cassia bud of commerce is the immature fruit and the fleshy receptacle of the seed of the cinnamon-tree. The prepared buds have the appearance of nails with roundish heads. Cassia buds possess the same properties as cinnamon, but in an inferior degree. They are chiefly prepared in the Eastern Archipelago. The price current of cassia buds in the Canton market is commonly about 6*d.* or 7*d.* a pound, and the import duty for the same quantity is 1*s.* About 1815, the price current of cassia buds in London was from about 5*s.* 6*d.* to 6*s.* 6*d.* per pound. Cassia buds have not hitherto been an article of export from Ceylon, although they might be collected there in great quantities. In 1816, the writer of this paper prepared about 100 pounds weight of cassia buds at Colombo, which were sent to this country, by the late Sir Robert Brownrigg, for the purpose of drawing the atten-

tion of Government to this article of commerce, which was quite new in as far as Ceylon was concerned, for it does not appear that the Dutch prepared them during their occupation of the island.

"'2nd. *Cinnamon.*—This highly esteemed spice is the prepared bark of the cinnamon-tree. The cinnamon harvest commences in Ceylon early in the month of May, and continues until late in October. Shoots, having a diameter of from half an inch to three inches, yield better cinnamon than larger shoots or branches. The shoots are peeled, by making a longitudinal incision through the bark on both sides, and then introducing a knife under the bark, and thereby separating it from the wood.

"'The green, or outer bark is scraped off from the inner bark, which, after being carefully dried, becomes the cinnamon of commerce. The Ceylon cinnamon is commonly formed into quills or pipes about forty inches in length. Great care is taken to prevent the cinnamon which is exported from being mixed with inodorous and tasteless bark. There are great differences in the quality of cinnamon, which it is presumed are occasioned by varieties in the climate, soil, or exposure in which the plant grows, the age and health of the tree, and the care and skill employed in its preparation. Cinnamon is exported from Ceylon in bales of 92½ pounds weight, covered with double cloths made of hemp, and not as has been stated, of cloths made of the bark of the cocoa-nut-tree. The cocoa-nut-tree has no bark.'"

For the purpose of superintending the sorting and baling of the cinnamon, the East India Company employed an inspector and two assistants, at Colombo in Ceylon, and the person who furnishes the account we are quoting from Mr. Holman's book, was one of these assistants for a number of years. Few persons, therefore, are likely to be so well acquainted with the produce of this tree as the one whose description we proceed with.

"3rd. *The essential Oil of Cinnamon.*—This oil is chiefly prepared in Ceylon, and generally from the broken portions which are separated from the quills during the inspection and sorting. The cinnamon chips are grossly powdered, and then they are immersed for about forty-eight hours in sea-water. The process of distillation follows, when an oil comes over, which separates into two kinds, a heavier and a lighter; the light oil separates from the water in a few hours, but the heavy oil continues to precipitate for ten or twelve days. Eighty pounds weight of cinnamon yield about two and a half ounces of oil, which floats upon water, and five and a half ounces of heavy oil. Cinnamon oil pays an import duty of 1*s.* per ounce, and that quantity usually sells at about a guinea.

"The leaves of the cinnamon-tree yield an essential oil, which exactly resembles the essential oil of cloves; and the bark of the root is strongly impregnated with camphor, from which it may be extracted by sublimation.

"All the cinnamon-trees in Ceylon belong to Government, and persons who are discovered uprooting trees, for whatever purpose, are liable to the penalty of transportation. By decoction the ripe berries yield a suety matter which is inodorous. This substance is sometimes used by the natives as a liniment for bruises, but they do not as has been often alleged, make it into candles, for the purpose of diffusing the fine odour of cinnamon, or for illumination. The peeled wood, which is inodorous, is used for fuel only."

We learn from this account also, that the cinnamon was divided by the sorters into three kinds. The Company's contract comprehended the first two sorts, and the third remained in possession of the Ceylon Government. But at length this inferior kind found its way, by a circuitous route, to England, where it was imported not under the name of cinnamon, but under that of cassia.

## ON BRITISH GRAPE WINES.

Several works have within these few months come under our notice, which have treated of wine-making both abroad and at home. As regarded the former, the vine is the plant that is of course considered, but as regarded the latter, our common fruits were in these notices chiefly referred to, such as currants and gooseberries. We have, however, observed in the last April number of the "British Farmer's Magazine," a paper by the author of the "Domestic Gardener's Manual," which treats of the "culture of the vine, with a view to the preparation of pure British grape wine," in a very distinct and instructive manner, and from which we shall now borrow some hints and information. The writer maintains that it is possible and profitable to prepare pure wholesome wines from British grapes. It has become a prevalent opinion no doubt, that our climate is unpropitious for such a produce, and yet it cannot be denied that wines at one time were extensively manufactured in some parts of England, nor can it be maintained that the seasons have deteriorated; while it will be admitted, that though the richest grapes come from plants of a richer nature than any that grow under our changeable and moist atmosphere, yet we have at least several varieties that yield fruit of a superior quality. Nor is it to be forgotten that unripe fruit, and even vine leaves produce good wine.

We need not do more to prove the possibility and profitableness of British vines for wine-making than quote the account given a number of years ago by the Honourable Charles Hamilton, of his success in his vineyard at Pain's-hill, Surrey. This vineyard is situated on the south side of a gentle hill; the soil being a gravelly sand." "It is planted," says that gentleman, "entirely with two sorts of Burgundy grapes; the *auvernat*, which is the most delicate and tender; and the miller's grape, originally so named from the powdery whiteness on the leaves in the spring, called in England the *black cluster*, or Burgundy grape. The first year I attempted to make wine in the usual way, by treading the grapes, then letting them ferment in the vat till all the husks and impurities formed a thick crust at the top, the boiling ceased, and the clear wine was drawn off from the bottom. This essay did not answer; the wine was so harsh and austere that I despaired of ever making red wine fit to drink; but through that harshness I perceived a flavour something like that of small French wines, which made me hope that I should succeed better with white wine; that experiment succeeded far beyond my expectation.

"It would be endless to mention how many good judges of wine were deceived by my wine, and thought it superior to any Champagne they ever drank. Even the Duke de Mirepoix preferred it to any other wine. But such is the prejudice of some people against any thing of English growth, I generally found it most prudent not to declare where it grew till after they passed their verdict upon it. The surest proof I can give of its excellence is, that I have sold it to wine merchants for fifty guineas a hogshead, and one wine merchant, to whom I sold 500*l.* worth at one time, assured me he sold some of the best of it from seven shillings and sixpence to ten shillings per bottle.

"After many years' experience, the best method I found of managing it was this—I let the grapes hang till they had gained all the maturity the season would give them; then they were carefully cut off with scissors, and brought home to the wine barn in small quantities, to prevent their breaking or pressing one another; then they were all picked off the stalks, and all the mouldering or green ones discarded, before they were committed to the press, where they were all pressed in a few hours after they were gathered. Much would run from them, before the press squeezed them, from their own weight on one another; this running was as clear as water, and as sweet as syrup, and all of the first pressing and part of the second continued white; the other pressings grew reddish, and were not mixed with the best. As fast as the juice ran from the press into a large receiver, it was put into the hogs-

heads and closely bunged up. In a few hours one would hear the fermentation begin, which would soon burst the cask if not guarded against by hooping them strongly with iron, and securing them in strong wooden frames, and the head with wedges. In the height of the fermentation I have frequently seen the wine oozing through the pores of the staves. These hogsheads were left all the winter in the cold barn to have the benefit of the frost. When the fermentation was over, which was easily discovered by the cessation of the noise and oozing (but to be more certain, the pegging the cask shewed when it would be quite clear); then it was racked off into clean hogsheads, and carried to the vaults, before any warmth of weather could raise a second fermentation. In March the hogsheads were examined; if they were not quite fine, they were fined down with common fish glue or isinglass, in the usual manner; those which were fine of themselves were not fined down. All were bottled about the end of March, and in about six weeks would be in perfect order for drinking, and would be in their prime for above one year; but the second year the flavour would abate, and would gradually decline till it lost all its flavour and sweetness. Some that I kept sixteen years became so like old hock, that it might pass for such to one who was not a perfect connoisseur. The only art I ever used to it was putting three pounds of white sugar candy to some of the hogsheads, when the wine was first turned from the press, in order to conform to a rage that prevailed to drink none but very sweet champagne."

The author of the "Domestic Gardener's Manual" goes on, after the above extract from the Honourable Charles Hamilton's "Method of making Grape Wine," to say that he is not going to consider the manufacture of wine upon so grand a scale, nor from the pure juice only, of the grape; for he argues that excellent wine may be produced in small quantities in every family where one or two trees bear from 50 to 100 pounds annually of sound fruit; or if the climate be unfavourable to the maturing process, unripe grapes, or even leaves afford a good substitute. We shall at present confine ourselves to an account of these two last mentioned sources of good wine, in which the author of the Domestic Gardener's Manual has, by the paper in the "British Farmer's Magazine," drawn his information chiefly from Dr. Macculloch's "Remarks on the Art of making Wine."

"*Process for making Ten Gallons of Wine from Unripe Fruit.*—Forty pounds of the grapes are to be placed in a very clean tub, capable of containing fifteen or twenty gallons, and bruised in successive portions, care being taken to crush each berry, without breaking the seeds. The stalks may be used, as they add no unpleasant flavour. Four gallons of cold water are then to be added, and the contents are to be stirred and squeezed till the juice and pulp are separated from the solid matters; after which, the juice is to be strained through a coarse bag, by as much force as can be applied. These directions refer particularly to the first processes in the preparation of gooseberry and currant wines, and may be useful to those who intend to prepare those liquors; it is added, with grapes, however, 'the husks may always be fermented in the vat with the fluid, and with the exception of the seeds, no harm can arise from bruising the solid matters, since the skins give out no bad properties.' Whenever the juice is strained off, one gallon of fresh water may afterwards be passed through the *marc* to remove any remaining soluble matter. 'Thirty pounds of white sugar are now to be dissolved in the juice thus prepared, and the total bulk of the fluid made up with water to the amount of ten gallons and a half.'

"This *must*, the Doctor adds, is equivalent to grape juice, and it is to be put into a vessel of sufficient size to contain it; a deepish tub is best, which will leave but three inches space above the surface of the liquor; for the uncovered wood attracts some of it, and, as no spirit is there formed, the syrup on the wood is liable to be changed to acetous acid, by the action of atmospheric air. To prevent this, let a coating of lime be applied to the wood above the liquor: it will correct acidity, and do the fermenting must no injury.

"The vessel is to be placed in a temperature varying from 55 to 50 deg. of Fahrenheit's thermometer; there 'it may remain for twenty-four hours, or two days, according to the symptoms of fermentation which it may show; and from this tub it is to be drawn off into the cask in which it is to ferment.'

"This cask is to be kept filled with the surplus portion of must, preserved in a jug or bottle for the express purpose.—When the hissing is very much diminished, a bung is to be driven in, and a hole bored for a vent peg, which is to be put into it, and, occasionally, loosened, in order to permit any material volume of air that has been generated to escape. When no danger is longer to be apprehended, and little air escapes at the small hole, the spile is to be permanently fixed tight.

"'The wine thus made must remain over the winter in a cool cellar, as it is no longer necessary to provoke the fermenting process. If the operator is not inclined to bestow any further labour or expense on it, it may be examined in some clear and cold day, towards the end of February or beginning of March, when if fine, as it will sometimes be, it may be bottled without further precautions.' The wine thus produced will be sweet, and in the case of gooseberry, 'be similar in qualities (flavour excepted), to the wines of Champagne, with the strength of the best Sillery.'"

"'If dry wines are desired, the proportion of the fruit to the sugar must be greatest' (40lb. to 30lb.) 'that has been named. The bung must remain open, *but the fluid must not be allowed to escape;* while, if the fermentation proceeds languidly, it must be accelerated by heat and agitation. If, when it is finished, the wine continues too sweet, it may be bunged down till the spring, without racking, or fining' (with isinglass), 'when the fermentation must be again renewed' by rolling the cask, stirring the liquid, or, by 'adding some fresh juice of the same fruit. At whatever time, and under whichever of these processes it has become dry, it is to be carefully fined and racked into a sulphured cask, and bottled after being once more carefully fined.'"

"*Grape-leaf Wine.*—The leaves may be taken at any time, from vines cultivated expressly for this object; in other words, from standard trees fastened to stakes, as in the vineyards, and never pruned. Even the young green cuttings and tendrils are equally useful. One caution ought to be observed; if any portion of leaves be removed from trained fructiferous trees, not one must be touched which is opposite to a bunch of grapes, as not only is the fruit in a degree dependent upon its neighbour leaf, but the young bud at the base of the foot-stalk will be either lost or injured whenever a leaf is taken away: hence vines ought to be grown expressly for leaves, and the *claret*, as Dr. Macculloch observes, may be cultivated for this purpose, as then the wine will have a red colour. He recommends young and not fully grown leaves; but those of the claret have no colour till late in the autumn.

"For ten gallons of grape-leaf wine, 'forty or fifty pounds of such leaves being introduced into a tub of sufficient capacity, seven or eight gallons of boiling water are to be poured on them, in which they are to infuse for twenty-four hours.' The liquor is to be poured off, and the leaves then pressed, to force out the retained liquid: the mass is to have a gallon of cold water poured over it, and, subsequently, is to be pressed a second time. Sugar, from 25lb. to 30lb. is to be dissolved, and the quantity made up to ten gallons and a half; after which, the processes of fermentation, barrelling, racking, &c. previously described, are to be followed.

"A little experience will, of course, be required, but, I can assure the reader that very good wine, of a pleasant vinous flavour, may be produced from grape-leaves; nor need ten gallons be made; I have, on several occasions operated with one, two, or three gallons, and in glass vessels. Once, and simply with a view to determine the colour and quality of an infusion of claret grape-leaves, of which I then had very few, I made a single quart of fluid, which, with the juice of two or three bunches of ripe grapes, and eight or ten ounces of sugar, pro-

duced a vinous fluid, of an agreeable flavour, beautiful crimson colour, and which would have kept sound for years. The whole process was carried on in glass."

Many circumstances may combine to influence the quality of wine. But Dr. Macculloch observes—"That the impatience of the makers of domestic wines to enjoy the produce is one of the frequent causes of failure. They are generally drunk a year or two and longer before they are completed; since even the best wines of foreign countries often require many years to bring them to perfection. It is very common for the made wines to possess a bad flavour when first made, not unlike that which has hitherto infested most of the wines of the Cape. Time dissipates this, even in the bottles; and in some experiments made for this purpose, it was found that a wine made from vine leaves, of which the smell and taste were, owing to some accident, intolerable, became, after six years, so perfect as not to be distinguished from White Hermitage."

The same authority argues that spirits of any kind are factitious additions, void of any utility whatsoever, and only productive of narcotic effects at a vastly increased cost. The natural materials employed, produce, by spontaneous fermentation, a vinous alcohol, of sufficient power to burn freely when thrown on live coals, and preserve the wine in an improving state for fourteen years. There can be therefore no good reason for adding laborated distilled alcohol to the wine.

The writer from whose paper we have been gleaning, and whose intimate knowledge of the produce and culture of the vine, enables him to lay before his readers the most valuable experiments of others regarding the treatment of this easily managed and grateful species of tree, explains a method of raising vines, which makes a tree at once, that has been employed by Mr. Mearns, gardener to the Duke of Portland, at Welbeck. This ingenious method, which has formerly been described in various horticultural publications, has been tried by the writer we gather from, and seems so feasible that it would be well were it generally understood. But it requires a hot-house, or some sort of pit, where bottom heat can be applied.

It is supposed that in the course of training a vine upon the long-rod system, a branch of twelve, sixteen, or twenty feet, which has borne grapes for two or more years, has by it a young shoot which could be made to occupy its place on the wall. The old branch is cut out, provided it have at its summit from three to six feet of last year's wood that will bear in the ensuing summer. Next, let all the eyes be cut off or blinded upon the old wood, below the terminal new shoot coil. This old wood is coiled round and round, in a large garden pot, having first laid an inch or two of broken pots or cinders at the bottom, for drainage. The old wood being all wound as evenly as possible, press into the pot a rich soil, composed of chopped green turf, three parts; and one part of black reduced dung. A number of pots may thus be prepared, and plunged to the rims in a bed of leaves, or other fermenting materials, not exceeding 65 or 70 degrees of heat. The atmosphere of the house to be below that average, that an abundant supply of radical feeders may be promoted before the young buds emerge. Mr. Mearns recommends that the whole shoot above the soil be enveloped in moss to its extreme point, to be tied on with bass, and constantly kept wet, avoiding to bind the bass round the eyes of the vine. Three or four stakes may be stuck into the pot, to fasten the shoot to them in a spiral coil. Fibres will be propelled into the soil, and by the time the buds begin to break and show themselves through the moss, the plant will be furnished with an amazing number of vigorous absorbers of nutriment. The protrusion of the buds during the low temperature above, and the comparatively exciting heat below the surface, will indicate the progress of the roots, and the necessity of increased temperature. This *must be cautiously* raised to 55, 60, and 70 degrees; and if the cutting be a good one, and the treatment judicious, a crop of perfect grapes will be secured, equal to that which would be yielded by a similar extent of rod upon an ordinary plant, either in a pot, or on the rafter. A perfectly rooted plant can be thus brought forward in three or four months, from an unrooted shoot, which shall not only yield fruit during the period of its progress, but furnish a fine tree for the wall of the garden by the following autumn.

Such are some of the most interesting matters introduced into the paper we have met with, in the British Farmer's Magazine for last April, communicated to it by the author of the Domestic Gardener's Manual, whose researches and experience surpass those of most men on rural matters.

## THE FORESTS, &c. OF NORTH AMERICA.

The other day, on looking into a Narrative of the Visit to the American Churches, by a Deputation from the Congregational Union of England and Wales, we met with a few notices of rural scenes, wild and cultivated, which we take the liberty to quote:—"Towards day-break," says the writer, "we drew near to Owensville. The forest, which had lately stood off in the distance, gathered round me, and demanded, with the confidence of an old friend, my admiration. Like ourselves, it was the same, and yet not the same. Every region presents you with its favourite species; and as they approach the line of separation, the species run into each other, and place before you every variety of combination, growth, and beauty. It is one of the wonders of the forest, that with such simple elements it supplies you with such endless variety. The kinds most prevalent now were the maple, the sugar-tree, the vine, the hiccory, the beech, and the oak, in all its varieties. The first two are very abundant, and they yield large supplies of sugar to the inhabitants. Every where you see the sugar-tree subjected to the process of tapping. This is of course done when the sap is rising in the stem; the saccharine juice then oozes out, and running through a little wooden trough, made to project from the side of the tree, it falls into a vessel below, which is placed to receive it. These molasses are very fine, and are much preferred by the people to those of the sugar cane." Sir Walter Scott thought nothing in nature could be grander than one of these immeasureable forests, and nothing more exciting than to be in the heart of one of them, hundreds of miles from the cultivated abodes of mankind. But even on the outskirts of these dense and interminable scenes, the writer we quote, found, and has delineated pictures of no mean interest. He says of a ride to Guiandot;—"The last stage was on a line with the Ohio, on a fine piece of road; and it presented us with a change of scenery highly beautiful. The wild vine became here a prominent feature. In the thicker forest, it frequently shows a dozen or a score of large naked stems, running up into the tallest trees, and quite detached from the trunk, and strangling it in its growth, leaving you to wonder how it could ever get there, and presenting rather a curious than a beautiful object of sight. But here it grew on the margin of the forest, and luxuriated in light and air; and the effect was often most pleasing. It ran up the shorter trees; used them as a mere skeleton; covered their heads with its luxuriant foliage; and threw out its dishevelled arms and tendrils to the ground, so as to form the most inviting canopies and alcoves."

These are very fine rural pictures, and so pleasant to read of, that we willingly extract one or two more. The first belongs to something more magnificent than any instance of landscape gardening that man ever imagined. "You come suddenly," says the writer, "to a spot which is called the Hawk's Nest. It projects on the scene, and is so small as to give standing only to some half dozen persons. It has on its head an old picturesque pine, and it breaks away at your feet abruptly, and in perpendicular lines, to a depth of more than 200 feet. On this standing, which, by its elevated and detached character, affects you like the Monument, the forest rises above and around you. Beneath and before you is spread a lovely valley. A pacific river glides down it, reflecting, like a mirror, all the lights

of heaven; washes the foot of the rocks on which you are standing; and then winds away into another valley at your right. The trees of the wood in all their variety stand out on the verdant bottoms, with their heads in the sun, and casting their shadows at their feet; but so diminished as to look more like the picture of the things, than the things themselves. The green hills rise on either hand and all around, and give completeness and beauty to the scene; and beyond these appears the grey outline of the more distant mountains, bestowing grandeur to what was supremely beautiful. It is exquisite. It conveys to you the idea of a perfect solitude. The hand of man, the foot of man, seem never to have touched that valley. To you, though placed in the midst of it, it seems altogether inaccessible. You long to stroll along the margin of those sweet waters, and repose under the shadows of those beautiful trees; but it looks impossible. It is solitude, but of a most soothing—not of an appalling character; where sorrow might learn to forget her griefs, and folly begin to be wise and happy." The Hawk's Nest is described as only a good introduction to the ride across the Alleghany Mountains, and others in alliance with them, where scene after scene present endless variety and perfect beauty.

"The mountains here do not offer you that one commanding view which may be obtained elsewhere, but they present you with continued pictures, which charm the eye and regale the spirits. I attribute this principally to two causes. First, that the forest is no where on a level; it runs along the sides of the mountains in galleries, bathed in the light of heaven, and while it towers over you on the one side, it leaves the more distant prospect on the other side always open to the eye. The second is, that at the feet of these majestic trees, the oak, the pine, the cedar, the beech, and the tulip, you find such an astonishing supply of the finest shrubs and flowers; the laurel, the shumac, the dog-wood, the rhododendron, the cranberry, the whortleberry, and the strawberry; the rose, the marigold, and the campanula, with a thousand wild plants and flowers, were all here, and gave a wonderful freshness and sweetness to the scene. It has all the grandeur of the forest, with all the beauty of the garden."

As an object of curiosity, there is notice taken of a tree called the charter oak, which figures at Hartford, a thriving town on the banks of the Connecticut. "It is considered to be an aboriginal of the forest; and though it has seen a city grow up about it, and generations pass away, it is still full of vigour, and crowned with living beauty. It is as sacred to the people, as it would be to a race of Druids, from the following circumstance. Sir Edmund Andross was sent over in 1687, to demand the charter of the colony. He had a meeting with the responsible parties on the subject; and when Wadsworth comprehended his intentions, he threw his cloak over the table, extinguished the lights, and disappeared with the charter. It was carefully hidden in the body of this venerable tree, and remained there for many years. When there was nothing more to apprehend for it, it was taken out, and is now deposited in the office of the Secretary of State."

We have a notice in the same work of an exhibition of the Horticultural Society at Boston, which may be considered as more immediately belonging to our purpose than any of the preceding. We have understood that horticulture and botany are at a low ebb in the United States. It is therefore the more gratifying to read of any spirited Society's existence and rising importance, such as that here spoken of. "On the morning after our arrival," says the writer, in reference to Boston, "I attended my friends to an exhibition of the Horticultural Society. It is made in the Public Hall—a large room, with galleries in the chapel style. It is frequently called the Cradle of Liberty, since it was here that the celebrated resolutions were passed to resist the tea-tax. The room is decorated with several pictures, and at this time the galleries were filled with young pines, and amongst the pines were suspended a number of singing birds; rather a forced attempt certainly to bring the freshness and melody of the woods into the city. To the eye, however, it was more grateful than a vacant space. For the area, there were along the sides of the walls, and resting against them, galleries filled with rare and curious plants; and in the centre of the room were tables covered with the handsomest specimens of fruits and flowers that could be produced by the members. And every where there were gay festoons and garlands of flowers, suspended from table to gallery, and gallery to ceiling. The specimens, which were really the subject of exhibition, were, for the age of the institution, and the circumstances under which they were produced, exceedingly good, and discovered great zeal, and practical skill on the part of the contributors.

"When the company had leisure to inspect and admire the productions, an address was delivered before the Society, by Mr. Gray, an intelligent merchant of the place. It commended the subject to their attention and pursuit, by an exposition of its advantages and their facilities. It was a very sensible address, and composed in good taste and liberal spirit; and was, in fact, an evidence of the humanizing and elevating influence which nature exerts on her true disciples. "Mount Auburn is about two miles beyond Cambridge, and is a place of burial. It embraces no less than sixty acres of ground, and is a late purchace of the Horticultural Society, with the intention of forming at once a garden and a sepulchre. The land is fine, clothed with young wood, and has beautiful undulations, affording alternately the most quiet little dells and pleasant outlooks. There cannot be a better scope for English landscape gardening than it supplies; and a skilful hand might soon place it above Père la Chaise. It can never be so rich in tombs as this is; but Père la Chaise has no sense of retirement about it. This, even as it is, gives you the sense of silence without sadness, and retirement without gloom. But I am jealous of the hand of the mere horticulturist; and there are already reasons for this distrust. Formal beds and flowers, assorted by their genius, least of all accord with a cemetery. Now, it is not uncommon to see flowers crowded together over the new made tomb; and there not the humble daisy, violet, and primrose, which might spring from the sod and sleep on its bosom, but showy and glaring flowers, evidently fixed on the soil by an intrusive hand."

## DESCRIPTION OF THE PLATES.

### HIBISCUS TILIACEUS.

LIMETREE-LEAVED HIBISCUS.

Class.—Monadelphia Polyandria.

Nat. Ord.—*Malvaceæ.*

STEM woody, twisted, pithy; eight or ten feet in height; dividing into many spreading branches towards the top, which are covered with a brown bark and a woolly down. Leaves alternate, of a livid green on their upper side, and hoary on their under, full of large veins. The younger leaves are subtrilobate, with three pores underneath. The stipules are large and rounded. The flowers are produced towards the upper part of the twigs from the axils, on peduncles an inch long, branched and supporting several flowers, forming altogether loose spikes. In figure and colour they resemble the *H. populneus*, but they are smaller, and roughish on the outside, nor are they so curled and wrinkled; on the lower part of the neck, instead of the five-leaved rose which there is in that, we have a large, round spot of a dusty red purple colour. Both calyxes are one-leaved; the outer cloven half way into ten parts; the clefts alternately larger and smaller; the inner cloven half way into five parts. The clefts equal and the length of the capsule. Capsule ovate, pointed at the top, silky, ten-celled, opening spontaneously in ten parts when ripe; cells closed on every side, sessile at the central angle, and five seeds in each.

1. Hibiscus liliæfolia.

2. Primula Auricula

3. Gaultheria Shallon.

4. Calycanthus Floridus.

5. Canostylis Americana.

6. Aralia Hispida.

Native of the East Indies; and almost everywhere within the tropics. In the island of Otaheite, they make matting of the bark, as fine as our coarse cloth. Also ropes and lines, from the size of an inch to that of a small packthread, and fishing-nets. Forster informs us, they suck this bark for food, when the bread fruit fails them; and in new Caledonia, the inhabitants frequently subsist on it, though it is an insipid food, affording very little nourishment.

It is propagated by seeds, sown on a good hot-bed in the spring; and the plants afterwards put into pots, filled with light earth, and plunged into a fresh hot-bed. It will flower the second year, if the plants are brought forward; otherwise not before the third or fourth.

## PRIMULA AURICULA.

AURICULA.

Class.—Pentandria Monogynia.

Nat. Ord.—*Primulaceæ*.

Leaves fleshy, succulent, with the edges mealy. Flowers in an upright umbel, very sweet, four or five. Calyx one-third of the length of the tube of the corolla, bell-shaped, toothed, mealy, as is also the scape. Tube of the corolla, gradually widening upwards, not contracted at the neck. Border concave, the segments emarginate, but not deeply, and not cut to the neck. The most common colours are yellow or red; but it is found also purple, and variegated with a white eye, powdered with meal. Capsule spherical or nearly so, flatted a little at top, of a coriaceous-cartilaginous substance, sprinkled with meal.

The description given above is from the wild plant of the Alps. To show what culture can perform in this species, we may mention, one plant was recently raised with no less than 133 blossoms upon one stem.

The raising varieties from seed, is well known. To enumerate all the diversities of this plant would be almost endless; for every year produces vast quantities of new flowers, differing in shape, size, and colour; in the leaves also there is great variety, so that the skilful florist can often distinguish the varieties from them.

It seldom happens that such flowers as are in great esteem at one time, continue to be regarded a few years after; still finer or larger flowers being produced from seeds, and as the name conveys little, and there are no descriptions of them, it is need less to give a list of them.

The properties of a fine auricula are these:—

1. The stem should be strong, upright, and of such a height as that the umbel of flowers may be above the foliage of the plant.

2. The foot stalks of the flowers should also be strong, and of a length proportional to the size and quantity of the flowers; which should not be less than seven in number, that the number may be regular and close.

3. The tube, eye, and border should be well proportioned; which they will be, if the diameter of the first be one part, of the eye three, and the whole border six parts or thereabouts.

4. The circumference of the border should not be starry.

5. The ground colour should be bold and rich and regular, whether it be in one uniform circle, or in bright patches; it should be distinct at the eye, and only broken at the outer part into the edging.

## GAULTHERIA SHALLON.

MOUNTAIN TEA, PARTRIDGE BERRY.

Decandria—Monogynia.—Linn.

Ericeæ.—Juss.

Gen. Des.—Gaultheria, *Lin.* Flowers monopetalous. *Calix* five-cleft, or five-toothed, bibracteate at the base. *Corolla* ovate, border partly five-cleft, revolute. *Filaments* of the stamina hirsute. *Torus* or receptacle ten-toothed. *Capsule* superior, five-celled, invested by the calix, which becomes a berry.

Spec. Des.—G. Shallon, *Ph.* erect, shrubby; leaves ovate, subcordate, serrulate, raceme secund, bracteate, pedicels, bibracteate in the middle.

This genus was dedicated by Kalm to Gaulthiere, a French physician and botanist, resident in Canada.

An evergreen shrub. *Branches* terete, verrucose, glabrous: the younger ones covered with a ferruginous pubescence. *Leaves* alternate, on very short petioles, ovate or broad oval, sometimes subcordate at the base, abruptly acuminate, serrulate, coriaceous, glabrous on both sides, beneath reticulated with prominent nerves and veins. *Racemes* terminal and axillary near the summit of the smaller branches; simple, with a ferruginous pubescence. *Flowers* secund, bracteate, white, besprinkled with a reddish humid pubescence. *Pedicels* solitary. with two bracteas about the middle. *Bracteas* lanceolate, *Corolla* urceolate, somewhat closed at the orifice, five-toothed. *Berry* subglobose, acute, fleshy, purple, externally hirsute, within semi-five-celled cells, many seeded. *Seeds* ovate, somewhat three-sided.

It was found by A. Menzies and Lewis and Clark, near the falls of the Columbia river; flowers in May and June. It is stated, by Pursh, that this elegant evergreen is in high esteem among the natives, on account of its berries, which they call *Shallon*, a name adopted by him for the specific distinction.

It can be increased by layers, suckers, and seeds, in a sandy peat soil. Tonic, astringent, refrigerant and other medicinal properties are characteristic of the natural order to which this genus belongs.

## CALYCANTHUS FLORIDUS.

SWEET-SCENTED SHRUB.

Icosandria—Polyginia—Linn.

Rosaceæ—Juss.

Gen. Des.—Calycanthus, *Lin.* *Calix* urceolate, many-cleft above, squarrose, with the segments coloured, resembling petals. *Corolla* none. *Styles* many. *Seeds* numerous, naked, smooth, contained in a ventricose succulent calix.

Spec. Des.—C. Floridus, *Willd.* Sweet-scented shrub. Segments of the calix lanceolate; leaves wide, oval, acute, tomentose underneath; branches expanding.

The name of Calycanthus is stated to have been formed by Linnæus, from the resemblance of the calix to a corolla.

A shrub from three to seven feet high, erect, virgate, stoloniferous, the younger branches pubescent. *Leaves* opposite, variable, broad oval or oval-oblong, acute, sometimes acuminate, entire, on short petioles, villous on the under side. *Flowers* solitary, axillary, and terminal, on short branches; the petalloid segments of the calix disposed nearly in two series. *Filaments* minutely pubescent, the interior generally without anthers; anthers at the summit glanduliferous. *Capsule* turbinate, as large as a small pear, becoming dry with the seeds loose, but never opening. *Seeds* oval, large, naked, smooth, and shining. Grows in fertile soils on the shady banks of rivulets in Georgia. Flowering in April and May, but rarely producing seeds.

The flowers of this much esteemed shrub are dark purple, and when expanded diffusing to a considerable distance an agreeable fragrance; a successsion of flowers throughout the summer may be obtained, it is stated, by cutting off the terminal leafbuds, after the usual flowering season. The wood and particularly the root are strongly camphorated.

All the species of this genus may be propagated with facility by layers and cuttings, in a rich loamy soil.

## CONOSTYLIS AMERICANA.

AMERICAN CONOSTYLIS.

Hexandria—Monogynia.—Linn.

Hæmodoraceæ.—Juss.

Gen. Des.—Conostylis, *Br.* *Flowers* naked. *Corolla* semi-superior, six-cleft, persistent, woolly. *Anthers* erect. *Style* conic, tripartite. *Stigma* simple. *Capsule* opening at the summit, three celled three valved many seeded.

Spec. Des.—C. Americana, *Ph.* American Conostylis. *Corolla* woolly within; scapes corymbose paniculate; leaves gramineous-ensiform, glaucous; filaments equal.

Conostylis, so called from the conical form of the style peculiar to the genus. Root fibrous, creeping. Leaves narrow linear, ancipital, very smooth; radical short and cespitose; cauline four to six inches long. Stem or scape one foot and a half high, erect, terete; when young covered with a white tomentum. Corymb many-flowered, wooly, at first contracted, but at length expanding. Pedicels as long as the flowers, incrassated, bracteate at the base. Corolla six-cleft, yellow within, segments oblong, acute, reflexed; the three interior ones narrower. Stamens about as long as the corolla, and inserted opposite to its segments; filaments subulate, smooth; anthers ovate, yellow. Germen semi-superior, roundish, smooth; style subulate as long as the stamens, divisible into three parts; stigma simple. Capsule ovate, obscurely triangular, covered by the persistent calycine corolla which adheres to its base, accuminate, three-celled, three-valved dissepiments arising from the centre of each valve. Seeds ten to fifteen in each cell, white, attached to the dissepiments, oblong, acute at one extremity, longitudinally striate. Flowering throughout July and August, in sandy swamps, in the pine barrens of New Jersey. Increased by division, and offsets of the plant.

## ARALIA HISPIDA.

WILD ELDER.

Pentandria—Pentagynia.—Linn.

Araliæ.—Juss.

Gen. Des.—Aralia, *Lin.* Flowers umbelled. *Calix* five-toothed, superior. *Petals* five. *Stigmas* sessile, subglobose. *Berry* five-celled, five-seeded.

Spec. Des.—A. Hispida, *Mx.* Wild Elder. Suffruticose; stem and petioles hispid; leaves doubly pinnate; leaflets ovate, incisely serrate, unarmed, glabrous, umbels with long peduncles.

The derivation of the generic name of this plant is unknown: De Theis, supposes it to be of Canadian origin.

*Stem* a foot and a half high, shrubby at the base, which is thickly covered with stiff bristles. *Leaflets* about an inch long, sessile acutely serrate. *Peduncles* terminal and axillary, bearing two to four umbels. *Involucrum* of many short subulate bracts. *Pedicels* filiform, smooth. *Flowers* greenish white. *Petals* reflected. It inhabits rocky woods and mountains in Canada, flowering from June to August. Increased by division of the roots or cuttings, in a sandy or loamy soil.

## GALARDIA BICOLOR.

Syngenesia—Frustranea.—Linn.

Compositæ.—Juss.

Gen. Des.—Galardia *Lam.* *Involucrum* many leaved, leaves nearly equal. *Florets* of the ray, three-parted. *Pappus* chaffy, chaff eight to ten-awned. *Receptacle* convex, bristly.

Spec. Des.—G. Bicolor, *Lam.* Stem branched; leaves lanceolate; paleæ of the papus, entire, awned.

M. Fougeroux dedicated this genus to his countryman M. Gaillard, an amateur of Botany.

This, as well as another species of the G. pinnatifada, was found by Dr. James near the Missisippi river. It flowers from May to August, and may be increased by seeds and cuttings in sandy soil.

## VIOLA SAGITTATA.

ARROW-LEAVED VIOLET.

Pentandria—Monogynia.—Linn.

Cisti.—Juss.

Gen. Des.—Viola, *Lin.* *Calix* deeply five-cleft, produced at the base. *Corolla* five-petalled, irregular, upper petal corniculate at the base. *Anthers* connivent, cohering. *Capsule* one-celled, three-valved.

Spec. Des.—V. Sagittata, *Ait.* Arrow-leaved violet, stemless; leaves oblong, acute, cordate, sagittate, serrate, incised at the base; flowers inverted; inferior petal smooth, the rest bearded.

*Root* perennial, short, thick. *Leaves* somewhat pubescent on the upper surface, crenate, dentate, incised, and often hastate at the base. *Petioles* about as long as the leaves. *Stipules* linear, smooth. *Scape* generally longer than the leaves. *Bracts* subulate opposite or alternate. *Flower* middle sized, purplish blue; petals oblong, obovate, all of them, except the inferior one, bearded with white; *spur* short, very obtuse. *Stigma* rostrate, depressed, margined. Grows on hills, in fields, and near mountains, in New England and Carolina; flowering from March to June.

It is of easy cultivation in a light loamy soil, and increased by division of its roots, or by seed.

## FRITILLARIA PUDICA.

Hexandria—Monogynia.—Linn.

Liliaceæ.—Juss.

Gen. Des.—Fritillaria, *Lin.* Flowers naked. *Corolla* six-petalled, campanulate, with a nectiferous cavity above the claws. *Stamina* the length of the corolla. *Capsule* superior; *seeds* flat.

Spec. Des.—Pudica, *Spr.* Leaves scattered, linear lanceolate; stem one-flowered; corolla nodding, campanulate; petals erect, sessile, spatulate-obovate, obtuse, smooth in the interior.

The name of this genus is said to be derived from *Fritillus*, a dice box, or, as some construe it, a chess-board, in which sense it is supposed to allude to the chequered appearance of the petals, peculiar to several of the species.

The root is perennial, bulbous; stem about one foot high; flower pale yellow, and handsome; flowering in April and May. The properties of the natural family to which the genus is allied, are those of secernant stimulants and emollients.

This species was discovered by Capt. Lewis, near the sources of the Missouri river, during his expedition to the Pacific ocean, in the years 1803 and 1804. From dried specimens in the herbarium of Capt. Lewis it was described and figured by Pursh, under the name of Lilium pudicum, though he acknowledged it to possess more affinity to the genus fritillaria. It was introduced into Europe in 1824, and arranged by Professor Sprengel into the present genus. It may be increased by offsetts in a loamy soil.

## MONARDA KALMIANA.

KALM'S MONARDA.

Diandria—Monogynia.—Linn.

Labiatæ.—Juss.

Gen. Des.—Monarda, *Lin.* *Calix* five-toothed, cylindric striate. *Corolla* ringent, with a long cylindric tube; *upper lip* linear, nearly straight and entire, involving the filaments; *lower lip* reflected, broader, three-lobed, the middle lobe longer.

Spec. Des.—M. Kalmiana, *Ph.* Kalm's monarda; thinly hirsute; heads large, simple; exterior bracteas coloured, lanceolate, attenuate; calix and corolla pubescent.

Root perennial; stem square, pilose; leaves oblong, pointed, stalked, ovate, somewhat fragrant. Flowers in heads, very long, beautiful crimson. Bracteas small, acute, grows in boggy woods, in black rich soil in New York; flowering in July.

7. Calardia Bicolor.

8. Viola Sagittata.

9. Fritillaria Pudica.

10. Monarda Kalmiana.

## BRECKNOCKSHIRE.

This county is one of the six that compose South Wales. It is bounded on the north by Radnorshire, on the east by the counties of Hereford and Monmouth, on the south by Glamorganshire, and on the west by the counties of Carmarthen and Cardigan. Its length is twenty-nine miles, the breadth of its southern basis thirty-four, and its circumference rather more than a hundred. It contains about 512,000 acres of land; 300 acres of water, besides the space occupied by its rivers and brooks. It is divided into six hundreds, and contains four market towns, Brecon, Hay, Crickhowel, and Builth. The Welch is the language of its inhabitants, who, in 1811, amounted to 37,735; in 1821 to 43,613; in 1831 to 47,763. Of the families in the last of these years, 4049 were employed in agriculture, 3703 in manufactures, trade, or handicrafts, and 1280 were included in neither of these classes.

The outskirts of this county, for the most part, consist of lofty mountains, while it is interspersed with hills almost throughout. It is indeed one of the most mountainous counties in Wales; the Vann or Brecknock Beacon being reckoned the highest in South Wales. It is sheltered in such a manner from the adjacent counties, that it is temperate. It appears, from observations made in the year 1802, with a rain guage, that 26¼ inches of rain fell at Brecon. There is a great variety, not only in the surface of the county, but also in the nature of the strata. In the hundred of Builth the soil is remarkably argillaceous, and the water does not sink sufficiently deep; in the Vale of Uske on the other hand, it is too porous to retain the necessary moisture. In general the soil of the vales consists of a light loam, lying on a deep bed of gravel; the soil of the hills is for the most part argillaceous. The principal river, next to the boundary one of the Wye, is the Uske, which taking its rise from the black mountain, in the western side of the county, on the border of Carmarthenshire, flows across it through a fine valley to the south eastern angle, passing the town of Brecon. A little to the east of this town is a considerable lake well stored with fish, out of which a rivulet runs to the Wye. The Brecon canal unites with the Monmouth canal, eight miles and a half from Newport, and one mile from Pontypool; it crosses the river Avon; is carried through a tunnel 220 yards in length; passes the town of Abergavenny towards the river Uske, and proceeds parallel with that river to Brecon, being thirty-three miles in length, with sixty-eight feet of rise to Brecon. By the fall of this canal from Brecon to the British channel, it appears that Brecon is 411 feet 8 inches above the level of the sea.

Sublimity and beauty are strikingly combined in the general scenery of this county. Its mountains, rising in rugged majesty, are separated from each other by cultivated vales, or by glades whose winding rivers are overhung on either side with the rich and varied verdure of extensive and lofty woods. "Between Slanspyddad and Penpont," says a tourist, "the scenery is truly enchanting. The Uske, frequently visible from the road, flows on the right amidst oaks of the most vivid green, which feather down the hills from the bottom to the very summit. All the rudeness of nature and the asperities of surface are concealed; while for the space of about a mile, every combination of wood, water, and figure of ground, as viewed from the road, unites to constitute the highest perfection of landscape. In majesty and sublimity the banks of the Wye infinitely surpass this; but in point of beauty we had seen nothing comparable to this scene." Beyond Penpont, however, the scenery loses much of its interest. The country becomes more uniform and dull in its aspect; the soil degenerates; and the hills have nothing attractive in their form or appearance, except that they admit of cultivation.

The proportion which the good land, within Brecknockshire, bears to the bad, is very small, not above one fourth part. To the traveller who had just passed through it by either of the turnpike roads, the fact, however, would seem to be otherwise. But it is cheering to behold that the agriculture of the county is superior, and far above most of the other counties of Wales. It appears, indeed, to have begun the race of improvement about the middle of the last century; for the Breconshire Agricultural Society was instituted in 1775, being one of the first associations of the kind in the island. The mode of culture in the good soils is conducted in the best manner; but where the land is naturally poor, as may be expected from such a disadvantage, and the poverty of the Highland farmers, the husbandry is very bad. In the Vale of Uske, the Norfolk rotation is followed with skill and success, and tolerably abundant crops of barley, clover, wheat, and turnips are obtained. In the vales the farms seldom exceed 150 or 200 acres; the rents are high in the neighbourhood of Glazbury and Hay—nearly forty shillings the *cyfair*, which is about one third less than the statute acre, being a usual rent; the poorest lands do not let for more than four or five shillings the cyfair.

We have stated that the mode of farming in the vales, and by the best farmers, is of a superior kind; we may note one or two peculiarities, however, which experience probably has sanctioned. They endeavour to sow their wheat as near as they can to the 29th of September. If they sow earlier, they will have a great deal of straw, but less grain; and if later, their grain will not be the worse, but the straw will be shorter. They do not like to sow their wheat in dry weather, but wait frequently for several days longer than they could wish, for rain to moisten the land for the operation. They desire a dry day to throw the seed into the earth, however, and would rather have a day or two of dry weather after the seed is sown. They admit, indeed, that this rule is not infallible, and that, on stiff land and clay, they would have better crops, if the land was quite dry when they sowed their wheat seed. They do not find that the oats thrive so well on their best bottom soils, as they do upon the moory upper lands, because their best land being of a sandy nature, the oats, from the heat, will ripen before they have time to fill, for they ripen in the valleys a month earlier than on the hills.

There is great room for improvement in the breed of cattle in this county. The attempts to introduce the Herefordshire breed, as might be expected, have failed, because the genius of the soil, and of course of the grasses, are much inferior. The Pembrokeshire and the Devonshire kinds suit better.

The benefit to be derived from the flooding of land is no where better understood, nor the operation more judiciously performed, than in this county. Nature has been so uncommonly bountiful in facilitating this operation, that little more has been left for man to do than gratefully accept of her proffered gifts. From the sides of surrounding hills the water rushes forth in innumerable springs, as if placed there for the husbandman's use, while the features of the county, from the great abundance of hillocks and swells, render it in a peculiar manner adapted to derive every advantage from irrigation, because the water moves quickly off, as soon as it has done its service. After they have cut the lattermath grass, they turn the waters on the meadows the first flood, for they always, of course, prefer flood to clear water. They suffer it to run over the ground for two or three days only—never longer at one time. At the end of ten or twelve days, they turn it on again, for the same space of time, and so on, till the end of March. They must, however, use the water when they can catch it, but when they have their choice, the above course is taken. Should the frost set in when the water is on the land, so that some spots should be covered with ice for some days, the spot so covered will be of a darker green, and appear more healthy in the spring than the rest of the field. But when they come to mow the hay, the crop will be considerably less. Should they forget to flood their meadows for one season, a loss of from one half to one third of the usual crops will be sustained. The ameliorating qualities of water may be understood from the anecdote of an intelligent farmer in this county, declaring that notwithstanding he valued his lattermath crop at fifteen shillings an acre, yet he found, that the cheapest manure he could dress the meadows'

with, was to sacrifice this crop once in ten or twelve years, by turning on the water in August, or whenever a flood happened after a long drought.

The woodlands do most discredit to this county. They are kept under no system whatever, nor is there the smallest attention paid to the preservation of them, either by landlord or tenant. Such trees as have escaped the general havock, by being out of harm's way, and arrive at timber, are then owned by the landlord, because they will fetch money. But little attention is paid to protect them from the browsing of cattle, the cottager's axe, or the hedger's billhook, so that it is wonderful how any of them arrive at maturity. By the custom of the county, notwithstanding that in all leases there is a clause to the contrary, the tenant may cut what underwood he wants for fire and hedge. But if he had a hundred acres more than he wants for those purposes, he cannot sell any from the farm. He will, therefore, scarcely raise a crop of young wood for the landlord's use, especially since he pays him rent already for the very land on which such wood must grow. The tenant, with some degree of reason, considers all the timber and other woods on the land, for which he pays rent and taxes, as intruding upon his right, and being always in his way, these will frequently feel the marks of his offended interests. But give him an interest in the trees, matters would be wonderfully changed, and growing as they do without any trouble or outlay to him, they would become his favourites. In order, indeed, to render the woodlands of Brecknockshire not only amongst the most beautiful, but most valuable parts of the island, all that is requisite is to let nature have her own way, and refrain from doing mischief to the young plants.

The principal exports of the county are wool, butter, and cheese. Of the first, a considerable quantity is spun and knit into stockings in the hundred of Builth, and in different parts of the Highlands. Some sheep, a few horned cattle, and a considerable number of swine, are frequently driven to Worcester, London, and Bristol. The cattle and horses are small; the latter have been much improved by the introduction of the Suffolk punch sort. A considerable number of otters frequent the rivers, the furs of which form another branch of the exports of Brecknockshire. The manufactures which formerly existed here, consisted of flannel, linsey-woolsey, and a coarse kind of cloth worn by the labourers; but of late these have become nearly extinct. The mines of iron and coal, have, however, been very much extended; and many forges and founderies have been constructed, which give employment to a considerable part of the population in that part of the county which is contiguous to Monmouthshire.

There is much room for improvement in the hilly parts of this county. There are large morasses, that might be most advantageously treated. The terms of the leases should in many particulars be changed; but what would be still better, is for proprietors to encourage, by addressing their measures to the evident profit of their tenants, the poor, and hardy, and indolent Highlanders.

## GARDENING OPERATIONS FOR JULY.

As January is the coldest, July is the hottest month of the year. The direct influence of the sun, indeed, is continually diminishing after the summer solstice, but the earth and air have been so thoroughly heated, that the warmth which they retain more than compensates, for a time, the dimunition of the solar rays. The effects of this weather upon the face of nature soon become manifest. All the flowers of the former month soon lose their beauty, shrivel and fall; at the same time their leaves and stalks lose their verdure, and the whole plant hastens to decay. Many plants, however, do not begin to flower till July: these are particularly the aromatic, the succulent, or thick leaved; several of the aquatic; and of those that are compound-flowered, in which many florets are collected into one head, as thistle, hawkweed, &c. The lily is one of the principal ornaments of gardens in this month; and with its delicate white flowers, gives an agreeable sensation of coolness to the eye.

The animal creation seem oppressed with languor during this hot season, and either seek the recesses of woods or resort to pools and streams to cool their bodies, and quench their thirst. The insect tribe, however, are peculiarly active and vigorous in the hottest weather. These minute creatures are for the most part annual, being hatched in the spring, and dying at the approach of winter; they have therefore no time to lose in indolence, but must make the most of their short existence; especially as their most perfect state continues only during a part of their lives.

The excessive heat of this period of the year, causes such an evaporation from the surface of the earth and waters, that after some continuance of dry weather, large heavy clouds are formed, which at length let fall their collected liquor in extremely copious showers, which frequently beat down the full-grown corn, and sometimes deluge the country with sudden floods. Thunder and lightning often accompany these summer storms. The farmer's chief employment in this month, is getting home various products of the earth. It is the principal hay month in the northern parts of the kingdom, and the work-people suffer much from the heat to which they are exposed. Flax and hemp are pulled. The corn harvest begins in the southern parts of the island.

### *Kitchen Garden.*

Plant out cabbages, savoys, broccoli, borecole, endive, and celery. Sow some broccoli seed about the beginning of the month. Sow some endive seed for a winter crop; the green curled endive is esteemed the best for this purpose, but some white and Batavian kinds may likewise be chosen. Some kidney-beans, of the dwarf kind, should be sown for a late crop; also turnip-rooted or Spanish radish, to be managed exactly like turnip. There are two kinds—the dark and the white—both of which stand the winter well. Some peas and beans may be sown when a late crop is wanted. As artichokes now advance to maturity, those who prefer one large head to two or three smaller ones, ought to cut off all the lateral heads from the stalks, before they exceed the size of a hen's egg; which will promote the growth of the principal head. It is a common practice to break down the stalks of artichokes near the ground, as soon as their heads have been cut for the table, to make them push more vigorously from the root. If the stalks of onions, garlick, and shallot, begin to decay, which is sometimes the case about the end of this month, they should be pulled up and dried.

### *Fruit Garden.*

As fruits advance to maturity, wall-trees should be protected from birds by nets, and means generally taken to destroy snails, wasps, and other insects. But as there are not any peculiar treatment to be insisted on, connected with this month, beyond such as have been detailed in some of the later ones, we need not take up space and time in repetition.

### *Flower Garden and Pleasure Ground.*

Some tender annuals may be planted out into the flower-borders in the open air. Seedling auriculus and polyanthuses may be planted out into a border not exposed to mid-day sun, at the distance of two inches from one another, and watered occasionally.

### *Nursery.*

Inoculate apricots, peaches, nectarines, plums, and pears; the first four are commonly inoculated on plum stocks, the last on pear or quince stocks. Inoculating, or budding, as it is termed, may be performed on many other trees and shrubs. Seedling pines, where they stand too thick in the seed-bed, may be trans-

planted; but great care must be taken to water them and shade them from the sun.

*Green-house and Hot-house.*

Green-house plants require a plentiful supply of water at this season. If the fruit have set too thick on orange or lemon trees, they should be thinned, otherwise they will not acquire a proper size. As many of the pines will now ripen their fruit, it is a proper time to begin to propagate these plants, which is done by planting the crowns that are produced at the top of the fruit, and the suckers which proceed from the root of the plants, about the time the fruit is ripe, or soon after they are cut. These suckers or crowns, if properly managed, will produce fruit in two years, and then decay. Each fruit is surmounted by at least one crown, which frequently has a number of offsets at its base; and each plant, after it has produced fruit, throws out from its root one or more suckers, before it decays. The crowns, when they are separated from the fruit, must lie five or six days in some dry place, till the part which was attached to the fruit is completely dried, before they are fit for planting. The suckers which proceed from the root of the plant should be taken off, when they have acquired the length of five or six inches, and when their lower extremity has become brown; they must likewise lie in some dry situation for a few days, till the part by which they were connected with the root of the parent plant be thoroughly dried. Put each crown or sucker into a small pot, filled with light rich earth, and plunge them in the bark-bed of a hot-house, or in a hot-bed made on purpose.

A method of raising pine apples in water was several years ago described by Wm. Bastard, Esq., Devonshire, in the Philosophical Transactions, that merits attention at any time, and should not be passed over in any account of the culture and raising this kind of fruit. He says,—"In the front part of the house, and indeed anywhere in the lowest parts of it, the pine-apple plants will not thrive well in water. The way in which I treat them is as follows:—I place a shelf near the highest part of the back wall, so that the pine apples may stand without absolutely touching, but as near it as can be; on this shelf I place pans full of water, about seven or eight inches deep: and in these pans I put the pine-apple plants, growing in the same pots of earth as they are generally planted in, to be plunged into the bark-bed in the common way; that is, I put the pot of earth, with the pine plant in it, in the pan full of water, and as the water decreases I constantly fill up the pan. I place, either plants in fruit or young plants, as soon as they are well rooted, in these pans of water, and find they thrive equally well: the fruit raised this way being always much larger, as well as better flavoured than when ripened in the bark-bed. I have more than once put only the plants themselves without any earth, I mean after they had roots, into these pans of water, with only water sufficient to keep the roots always covered, and found them flourish beyond expectation. In my house the shelf I mention is supported by irons from the top; and there is an intervening space of about 10 inches between the back-wall and the shelf. A neighbour of mine has placed a leaden cistern upon the top of the back flue, in which, as it is in contact with the flue, the water is always warm when there is a fire in the house, and finds his fruit excellent and large. My shelf does not touch the back flue, but is about a foot above it, and consequently the water is only warmed by the air of the house. Both of these methods do well. The way in which I account for this success is, that the warm air, always ascending to the part where the shelf is placed, as being the highest part of the house, keeps it much hotter than in any other part. The temperature in that place is, I believe, seldom less than what is indicated by 73 deg. of Fahrenheit's thermometer, and when the sun shines it is often above 100 deg.: the water the plants grow in, seems to enable them to bear the greatest heat, if sufficient air be allowed; and I often see the roots of plants growing out of the holes in the bottom of the pot of earth, and shooting vigorously in the water.

"My hot-house, the dimensions of which it may be proper to know, is 60 feet long, and 11 feet wide, the flues included: six feet high in the front, and 11 feet at the back of the inside of the house. It is warmed by two fires. A leaden trough or cistern on the top of the back flue is preferable to my shelf; as in it the pine plants grow much faster in the winter, the water being always warmed by the flue. Of this I have seen great benefit in my neighbourhood.

"It is not foreign to this purpose to mention, that as a person was moving a large pine from the hot-bed in my house last summer, which plant was just shewing fruit, by some accident he broke off the plant just above the earth in which it grew, and there was no root whatever left to it. By way of experiment, I took the plant, and fixed it upright in the pan of water, without any earth whatever, in the shelf: it then soon threw out roots, and bore a pine-apple that weighed upwards of two pounds."

We shall not now enter into the merits of the various sorts of pine-apples, as regards this country. This subject deserves a distinct consideration, and may ere long occupy our pages.

## AMERICAN AGRICULTURE.

The tourists that are daily inundating North America, seldom think it worth their while, or rather are seldom equipped with knowledge, to say any thing that is at all instructive regarding the rural economy of our brethren on that side of the Atlantic, taking the subject in its broad and practical extent. We have abundance of theories and philosophizings, by gentlemen of refinement, and ladies of sensibility, on this and every other theme of general importance. But to the emigrant, or practical student, these tasteful accounts afford no light of any value. We have, for example, *The Stranger in America*, Mr. Francis Lieber, an accomplished writer and man of the world, delighting the imagination with a fine distinction in the use of the term *peasant*, as applied to the cultivators of the soil in America. He says "there is no peasant in that country—the American farmer forms no class by himself. He is a citizen, not only as to political rights, but as to his whole standing and social connexion. No views of his own, no dress, distinguish him from the inhabitants of the towns. He may be rich or poor and is a farmer, that is all. He generally owns the land he cultivates in fee-simple; what he gains is his." Thus speaks the "Stranger in America," and no doubt what he says is both correct and descriptive. But when he comes to the subject of American agriculture, we have only such as the following generalities; all very pleasant and flattering, but not of more value than picturesque paintings.

"That you should not seek for refined and minute husbandry among the farmers in the west, who have to plough between the stumps, because the labour to dig them out would cost more than would be gained from the spots thus obtained, is evident; and, that, moreover, the facility with which a farmer can here obtain land, sometimes induces him to commit the common fault of farmers, of husbanding too much land, and thereby scattering his means, you may easily imagine. Bad as the soil is in the Mark Brandenburg, I have still but little doubt that in many places the farmer would obtain fair crops, could he be induced to abandon part of his land and cultivate the rest with greater care. The thirty years' war, which exterminated the inhabitants of some whole villages, threw too much land into the hands of the remainder. On the other hand, it is necessary to travel but a short distance toward the west, in order to be convinced how erroneous the frequent assertion is, that the Americans are more a commercial nation than any thing else; they are, on the contrary, thus far essentially agricultural, that not only the vastly greater part of them are farmers, but also that their disposition is fitted for the farmer life. Every American loves farming.

In this the Americans resemble the ancient Romans and the English, not the Greeks, who never were famous farmers.

"If I say, you should not seek for refined and minute husbandry here, I speak of the west alone. In some parts of the same state of New York, which have been settled for a long time, and where the price of the land is not so exceedingly low, if compared to the price of labour, farms are found which are managed with minute care, in all the different branches of husbandry; so that the farmer does not only compete with the cultivator of the soil in other countries, as to his chief article—wheat—but even butter is exported in considerable quantity from the farms along the Hudson or near it. Some of the best butter, called Goshen butter, is exported to Malta and other places of the Mediterranean, where the best kind brings as much as a halfpenny more per pound than the best English or Irish butter. This I have been told by a gentleman who had long resided in various ports of that sea. So we go; American butter sent to the shores of antiquity!"

But every traveller is not so general and so deficient in specific knowledge. Mr. Shirreff, a Scotch farmer, has, not long ago, visited North America, and taken a comprehensive view of the Canadas, as well as the United States, as adapted for agricultural emigrants. Of course, from him we do expect some precise and minute grounds for his opinions, which do not seem to flatter, but to communicate the real state of matters. He is a practical farmer in the strictest sense of the words; and since he belongs to East Lothian, one of the best farmed districts in the world, he is entitled to speak decisively, and enabled to do so without relying upon the opinions of others. His motive for going to that quarter of the globe, increases the claim he has upon our attention. He tells us, that a younger brother having expressed a wish to try his fortune as an American farmer, he (the author) resolved to explore the country for the purpose of acquiring such an opinion on the step contemplated, as might be useful to the person in whom he was so deeply interested. In thus travelling from a sense of fraternal duty, unfettered and unassisted by any party, we are entitled to place great reliance upon his representations. Let it be remembered, however, that as he belongs to a district in his native land, renowned for its agriculture, it is not to be expected that what seems in some other countries tolerable or good farming, will pass as such with him. The statement of the "Stranger in America," as above quoted, nevertheless must yield to that of Mr. Shirreff, wherever the two seem at odds.

The author landed from England at New York in the end of May, 1833, and visited, among other places in the vicinity of that city, Long Island, which has been termed the garden of the States; but he says, not certainly from the fertility of the soil, or the management of its numerous orchards. The most extensive nurseries in America are said to be in the same neighbourhood, at Flushing, but compared with such places in Britain, and some others which the author saw in that country, they were badly managed.

"Agriculture being little known as a science in any part of America, and but imperfectly understood as an art, the same diversity of opinion, and mode of management, prevail as in Britain, with greater difficulty of becoming acquainted with them. The following particulars relate to the neighbourhood of New York.

"Grass crops are mown for hay five or six years in succession, without being top-dressed or manured in any way—the aftermath, which is seldom abundant, being depastured. Five pounds of red clover, and half a peck of timothy seeds (phileum pratense), are sown on an acre; and also, occasionally, small quantities of herd-grass and redtop, two kinds of pœa. I believe the red clover lives longer than it commonly does in the cultivated fields of Britain, having seen many plants after five successive crops of hay. The grass, on being ploughed, is followed in the first year by Indian corn without manure, by potatoes with manure in the second year, and, if early, they are followed with buck-wheat; barley is taken in the third year, and in the fourth, oats accompanied with grass seeds. Potatoes are grown in drills as in Britain, and sometimes in hills three or four feet distant, formed by the surface being marked into squares by the plough. A whole potato, or three cuttings, are placed above the manure, and both covered over with earth by the spade. Disease in the potato was said to be unknown. The fruit crop is often injured by spring frosts, and wheat by mildew. Swede turnip is sown in August, and stored before winter. Geese are plucked three times a-year—live goose feathers being a general article of commerce."

Mr. Shirreff states, that throughout the whole of his transatlantic tour, the inhabitants of the country manifested perfect indifference to the beauties of nature. Nurserymen, seedsmen, and farmers, were generally unacquainted with the varieties of plants, and uninterested in the matter. We do not think that in this, and many other opinions expressed by the author, of the knowledge or works of the Americans, that he is prejudiced or hostile, because he as often lauds and discovers excellencies as he does the reverse. He seems to tell exactly that which he knew; and as he carried the works on America, written by former tourists, such as that of his countryman, Mr. Stuart, he was enabled, since he was at pains to do so, to compare their statements with his personal research. In these comparisons, however, he by no means always confirms the accounts of his predecessors. Take an example:—

"Having carried Mr. Stuart's work, 'Three Years' Residence in America,' with us, as a kind of guide-book, for which it is recommended in the author's preface, we experienced considerable disappointment at being unable to corroborate his description of Northampton. Instead of finding that 'much of the pavement and steps are of white marble,' we could only observe a small portion which consisted of red brick. I shall not, however, take upon me to say there is no white marble pavement or steps in the village, but three of us walked about for an hour and a half without discovering a single stone of white marble; we did not, of course, approach villas remotely situated from the public roads, with a view of gratifying our curiosity, but every street, lane, and walk which promised gratification, were explored. His allusions to the vegetable beauties are also unhappy, when he says, 'if a traveller in Britain were to stumble on such a place as this, he would not fail to inquire whose great estate was in the neighbourhood, and attribute the decorations of shrubs, flowers, &c. which adorn even the smallest habitations here, to the taste of a wealthy neighbour, or his being obliged to make them to promote electioneering views.' In the streets of Northampton, we numbered three or four bushes of lilac and white pipe, and a few roses, as the amount of shrubs adorning the foreground of houses, and flowers of small size were equally rare. The spaces were generally unmown grass, and in several instances luxuriant thistles and docks excluded light from the apartments. At the back part of the hotel in which we lodged, there was a garden, surrounded with a low ugly wooden fence, and crowded with the gaudiest of flowers, but our general impression was, that the gardens are ill kept, void of beauty, and unworthy of the place. I would require no better illustration of the small progress the inhabitants of the United States have made in gardening than Northampton, where man hath long resided, and does so little to improve the exquisite beauties of nature."

The portion of the United States over which he travelled, embraced the states of New England, Pennsylvania, New Jersey, New York, Ohio, Indiana, Illinois, and Michigan, and he confines his remarks to this region. On a comparison of the United States with Canada, as regards eligibility for emigrants and agriculturists, he leans decidedly to the former. We shall let him be heard in part of that which he here advances, although, as it may be supposed, we have room only for a very small portion of his views and arguments.

"The manners and customs of the people, as witnessed in public, are the same in both countries. In all things there is

much less refinement in Upper Canada, and the manner of the people are coarse, contrasted with those in the States. Morals seem to correspond with the manners. It was, however, the unfortunate emigrants from Britain and Ireland which imparted such a character to the population. Many individuals seemed to me conscious of self-debasement, and to have left home for the purpose of indulging their vicious propensities without encountering the scorn and censure of their friends and relations. Should it be thought that I have judged harshly of some of my countrymen, let it be remembered I speak only of what was observed in public, and that the bar-rooms of Upper Canada exhibited the worst part of British society, without a redeeming feature. The domestic manners and morals of the people of either country did not come properly within the scope of my observation. I may, however, remark, that I was favourably impressed with the manners of the royalist inhabitants of Canada, and it would be ungrateful on my part not to acknowledge the uniform civility and kindness which I experienced in private from every class of settlers.

"In the United States the machinery of government is controlled by the people, who do every thing for the welfare of the country, and political power is invested in worth and talent alone. In Upper Canada government is swayed by an aristocracy, who have never lost sight of their own interest in legislating for the country. A higher and more uniform tone of independence and self-respect pervades the inhabitants in the United States than in Canada. The emigrant who delights in lording over his fellow-mortals, and measures his importance and wealth by the servility and wretchedness of others around him, ought to shun the States. The emigrant who seeks a fair and favourable field for his industry, and aspires to share, in common with his brethren, the just rank and privileges of man, ought to shun Upper Canada.

"The United States are rapidly progressing, and their future prosperity seems illimitable. I ascertained there were eighteen large steam-boats belonging to the States on Lake Erie in 1833, and a gentleman who was there in 1834, assured me they had increased to twenty-four. By the official report of the Postmaster-General to the President of the United States, the annual transportation of the mail was, in 1829, 13,700,000 miles, and in 1832, 23,625,021 miles. There is not one-tenth of the surface yet devoted to the production of human food. The coal-fields of the west are perhaps inexhaustible, the water communication is almost without limits, and the extent of canals and railroads already exceed that of any other nation. The country is great even in its infancy. If its territory, consisting of 1,328,902,400 acres, were peopled to the same degree as England, containing a great deal of land which cannot be cultivated, the inhabitants would amount to 537,872,383, while the present population is about 14,000,000. A vast extent of the best soil, situated in the finest climate, is still unoccupied, and if the views regarding the assistance nature affords the farmer, and his reward affecting wages of other labour, which I have already laid down, be correct, industry cannot fail of meeting with a rich reward for many centuries yet to come.

"On a general view of the circumstances affecting the country and people of Upper Canada, much time will be required to develope the resources of the country; and a period of excitement is likely to intervene before a permanent government can be established.

"Every thing in the United States seems to me to be resting on a natural and sure foundation, with prospect of continued prosperity. In Upper Canada, most things appear to be on an artificial footing, and must consequently experience change. The States present a wider and a better field for the exercise of industry than Upper Canada; and the British emigrant, who must live by his own exertions, makes a sacrifice of his immediate interests, and in all probability the interests of his posterity, by preferring Upper Canada to the United States as a place of settlement.

"Many people may prefer Canada to the States, from having friends already settled there. Such a reason is not creditable to their friends in Britain, whom they leave behind. The person who makes up his mind to leave the place of his nativity, ought to employ his industry and capital in the best field, and endeavour to bring his friends who may have settled less fortunately to him."

## THE MITRE OAK.

THERE has been lately published, a poem called The Mitre Oak, the prefatory remarks to which afford some interesting particulars, not only regarding that particular tree, but other curious or celebrated specimens within the island. We shall make use of the information alluded to, satisfied that it must carry an antiquarian charm with it, from which we may gather some beautiful facts regarding the works of nature. The poem is by Luke Booker, a clergyman, whose researches furnish us with the following particulars; and the small work is dedicated to the Lord Bishop of Worcester, who is the episcopal proprietor of the Mitre Tree. The remarks we are going to extract, run thus:—

"To the lovers of Nature, all trees of unusual magnitude are objects of admiration; but perhaps none so much as the oak. Calmet says, pilgrimages were made to the oaks of Mamre, near Hebron, from the time of Abraham to that of Constantine. Alexander admired the oak, while he sought the laurel. The Arcadians regarded it with such superstitious veneration, that a wreath formed of its leaves was awarded as an honourable trophy, to every person who had saved the life of a citizen. The Druids might be termed oak-worshippers. The misletoe, so abundant upon apple-trees, is seldom known to grow on any other, and most seldom on the oak; but when found there, the discovery was hailed by this peculiar people with uncommon delight; and no one of the order was deemed of sufficient dignity to sever it from its foster-parent, except the Arch-Druid; who, ascending the tree, in a white vestment, performed the operation with an instrument of gold, curved like a sickle, receiving the precious branch, as a special gift of heaven, in the ample folds of his robe.

"In no country does the oak appear in greater majesty than in England. Whether in its growing state, in its full vigour, or declining age, it is an object on which the eye of the naturalist dwells with peculiar delight. The Mitre-tree may be regarded as the patriarch of his species in that part of Worcestershire it adorns; which perhaps was formerly distinguished by these ornaments of sylvan grandeur, which may be conjectured from the number of ancient families once resident in that vicinity, bearing the name of Acton, which signifies an oak. That the soil and climate are propitious to the tree, any naturalist may be convinced, on beholding, not far from the hoary relic already named, one of the noblest young oaks in the world, now growing in the Rectory-garden at Elmley Lovett. Although said not to be more than eighty years old, it is a prodigious tree, rearing its lofty head over every other that is near it. The Mitre-tree, however, baffles conjecture concerning its age, although, according to conclusions which will be stated, it is presumed that not fewer than ten centuries have rolled over it. As its name implies, the bishop of the diocese is its proprietor, and when it is recollected with what bishops that diocese has been honoured, a peculiar dignity, and a sort of sanctity is attached to this tree. A Latimer—a Hooper—a Hough—a Stillingfleet—a Hurd, were its proprietary lords, whose honoured heads it no doubt has often shaded, and beneath which they often would meditate. On the verge of the two parishes—Hartlebury and Ombersley—it arrests the notice of every way-faring passenger. Gigantic in size, and riven by time, its trunk has the appearance of an excavated rock; yet at the return of every spring, it assumes its leafy

honours, though not so profusely as it did antecedent to a singular disaster.

"We learn, that at one time, when some itinerant strangers at night were sheltering themselves beneath it, they ignorantly kindled a fire within its riven and hollow trunk, which, arid with age, immediately took fire, when the whole oak would soon have been destroyed, had not prompt means been taken to quench the flames. The damage however done, has not and never will be overcome, even by the giant vigour of this veteran tree.

"In Great Britain are many remarkable trees—that are remarkable for their magnitude, or some historical circumstances connected with them. Of this kind, is the great oak in Salcey Forest; which, being 47 feet in circumference, according to an admitted calculation, is supposed to be not less than 1,500 years old. Such is Herne's Oak, celebrated by Shakspeare, in Windsor Forest. Such even the scion of the Royal Oak, at Boscobel, which screened Charles the Second from his pursuers, while they were under it. A provincial paper stated, that when the parent tree lay prostrate on the ground, which fell within the memory of many now living, 'two horsemen, one on either side of its trunk, could not see each other.' Yet these venerable ancients may be termed only children of the forest, compared with the Cowthorpe Oak, in Yorkshire, which, in the year 1775, measured near the surface of the ground, 76 feet in circumference; making it, according to a certain hypothesis, more than 2000 years old, for it is said a tree of 30 feet in circumference may be supposed to have attained the age of 1000 years.

"It is certain the longevity of the oak is great. The one under which Abraham sat, 'in the heat of the day, on the plains of Mamre,' was said to remain, as abovementioned, an object of veneration in the time of Constantine. If so, the common opinion that an oak continues to grow vigorously 500 years—remains in vigour 500 years—and requires 500 years to decline, is not exaggerated.

"Of the trees in the park at Tredville, Mr. Strutt says, 'Nearly in the front of the family mansion of John Plumtre, Esq. is a group of oaks known by the names of Majesty, Stately, and Beauty. Seldom are three trees so different from each other in individual character, and so interesting altogether, to be found in near proximity: Majesty, as its name imports, is the largest, being somewhat more than 28 feet in circumference, at eight feet from the ground; and contains above 1140 feet of timber. Stately is a noble specimen of the tall oak; the stem being 70 feet, the girth, at four feet from the ground, 18 feet, and containing about 500 feet of timber. Beauty, at the same height from the ground, is 16 feet in circumference; and its solid contents nearly the same. The pleasure with which the spectator views these graceful trees is heightened by a conviction that they are likely to remain cherished and protected equally in their decay as in their prime.'

"That the oak was highly appreciated by various heathens of celebrated character, and deemed sacred by some of them, is well known. That by Christians it has likewise being held in peculiar estimation, we may infer from the numerous ones still in existence which are denominated 'Gospel Oaks,' dignifying many parts of England. The custom whence they derive this appellation is of very great antiquity; and if regarded only as boundary marks, they were useful; especially before their usefulness was superseded by parochial maps. When continued, as it still is in some parts, the custom is as follows:—In Rogation week, on some day or days before Holy Thursday, the minister of the parish, attended by his clerk, the churchwardens, the charity children, and as many of the inhabitants as choose to do so, perambulate the parish, stopping at particular places and remarkable trees; where, putting on his surplice, the minister reads a portion of the gospel. Among the trees thus selected as objects of demarcation, an oak of magnitude was always preferred. Hence 'Gospel Oaks' abound, or rather did abound in England, for their number is of course decreasing. Public-houses now are frequently to be found with the *signs* of the 'Gospel Oak,' standing where the sacred tree stood formerly. The Mitre Oak, however, still remains, which being on the confines of Hartlebury and Ombersley, was doubtless one of these distinguished venerated objects. Nor, to use the language of Mr. Strutt, would it be easy to find a more fit object than the broad oak to serve as an altar beside which to offer up prayers to God, as devout worshippers were wont to do, in solemn groves, before 'temples made with hands' were built to Him, and holy tabernacles were fixed by His own divine revelation. Herrick, in his Hesperides, thus tenderly alludes to these venerable remembrancers: a lover says,—

'Dearest! bury me
Under that Holy Oke, the Gospel Tree:
Where tho' thou seest not, thou mayst think upon
Me, when thou yearly go'st Process-i-on.'

"It is ascertained that many of those oaks which are called spontaneous are planted by squirrels. The author of that beautiful work, 'The Philosophy of Nature; or the influence of Scenery on the Mind and Heart,' says, 'Walking one day in the woods belonging to the Duke of Beaufort, near Troy-house, in the county of Monmouth, my attention was attracted by a squirrel, which sat very composedly on the ground, a few minutes, and then darted like lightning to the top of a tree; whence he instantly descended with an acorn in his mouth, and began to burrow in the earth. After digging or rather scratching a small hole, he stooped down and deposited the acorn. Then covering it, he darted up the tree again. In a moment he was down with another; which he buried in the same manner. This he continued to do, as long as I thought proper to watch him. The industry of these little animals is thus directed, no doubt, to the purpose of securing themselves against want in winter; and as it is probable that the memory is not sufficiently retentive to enable them to remember the spots in which they deposit every acorn, they lose some every year. These take root, spring up, and are destined to supply the places of parent trees, felled for naval uses; thus Divine Providence rendering Great Britian indebted to them for her pride, her glory, and perhaps for her very existence.'"

Our readers must be delighted with these tasteful notices; and we and they must feel grateful to the author of the "Mitre Tree," for collecting them into such a handsome narrative and dissertation as they even appear in our pages, though without some of the author's personal allusions of a pathetic or instructive nature, which we did not find immediately belonging to the character of our Magazine.

## BOTANY OF THE BARBARY STATES.

In a work lately published, written by P. B. Lord, under the title of "Algiers, with Notices of the Neighbouring States of Barbary," we find a familiar, pleasant, and we believe extremely accurate account of the botanical kingdom, as there found. The whole work is able and judicious, supplying at the present time an important and highly interesting body of information regarding a country that is not only but half-civilized, but of which we have till lately possessed imperfect and meagre accounts. Respecting its rural economy and botany, which alone belong to our department, there can only be a brief and compressed description, which is, as regards the latter branch, confined to the general character of the vegetation, and a notice of those plants which either in medicine or cookery are made subservient to the uses of mankind.

It is stated that along the whole tract which lies between the chain of the lesser Atlas and the sea, the vegetation is almost exactly the same as along the other coasts of the Mediterranean.

"Chestnuts, pears, apples, walnuts, grow almost without cultivation in the gardens of Algiers, Bleeda, and El Colea, while borage, hore-hound, different plaintains, docks, sorrel

and white sally, all natives of the central and temperate parts of Europe, spring up spontaneously here also, evincing by their presence that sort of intermediate or transition climate, which, not too hot for them, is yet sufficiently genial to bring to maturity the promegranate, the Indian fig, the olive, the palm, and the towering aloe. The warmth of the climate, however, with the productive nature of the soil, causes all sorts of vegetables to assume a rapidity of growth and increase of size unknown in our experience. Stalks of parsnips may be seen eight or nine feet high, so that a parsnip bed forms a little grove, while the leaves of the common mallows are as large as a dinner plate, and its stalks look like great branches. The Barbary fig forms thick hedges, which rise to a height of twelve or sixteen feet above the ground, while the hedges of agaves, with their long green and pointed leaves, crossing each other in every direction, and the long spike of yellow flowers rising from amongst them, and towering above all the surrounding trees, form a spectacle perfectly magnificent. The olive trees are as beautiful as our finest European oaks, and the oranges, limes, and citrons, rival in size our largest fruit trees. From about the end of February, every piece of land which is not cultivated or under-wood, becomes covered with different grasses, which grow with such rapidity, that before the end of a month it is quite laborious to attempt walking through them. 'On the 12th of May,' says M. Rozet, 'the grass, in crossing the plain of the Metijiah, reached up to our arm-pits.'"

Moist and marshy places, the beds of rivulets, of streams, and even of mountain torrents, which are dry for a great part of the year, abound in the beautiful oleander, which flowers all the summer, and lend a brilliancy to the whole landscape. Olives are common along the northern slope of the lesser Atlas; higher up there is an almost impenetrable crop of brushwood, beyond which are forests of oak, cosh-trees, and some pines; the oaks yielding sweet acorns, which are used as food. To the south of this range vegetation becomes stunted. But all the deficiencies, as the arid sandy plains of the desert approach, must be considered as compensated for by the presence of the date-palm, *Phœnix Dactylifera, L.* arriving at the greatest perfection in the vicinity of the desert.

"Here the palm is almost the sole vegetable production which can be made available to man's wants, it produces its fruit in the greatest abundance, and of most delicious flavour, while in more northerly regions, which abound in the cerealia and other productions of a more temperate climate, this noble tree is planted principally for ornament or shade, and little pains being bestowed on its cultivation, its fruit is consequently unmellowed and harsh flavoured.

"A palm-grove is really a beautiful object, and requires scarce less care and attention than a vineyard. The trees are generally planted in a quincunx, or at times without any regular order, but at distances from each other of four or five yards. The situation selected for this purpose is always on the banks of some stream or rivulet, running from the neighbouring hills, and the more abundant the supply of water, the healthier the plants and the finer the fruit. For this tree, which loves a warm climate, and a sandy soil, is yet wonderfully improved by frequent irrigation, and it is not a little singular, as mentioned by Desfontaines, that the quality of the water seems of little importance, its utility being equally obvious whether it is salt or sweet, or impregnated, as in these regions is often the case, with a quantity of nitre. Irrigation is performed in the spring, and frequently during the summer months. The water is drawn by small channels from the stream to each individual tree, around the stalk and root of which a little basin is made and fenced round with clay, so that the water, when received, is detained there until it soaks into the earth. Where two or more palm-groves happen to be situated along one stream, each proprietor can only divert the water in his own turn, and in some places a water-tax is levied on the owners of palm-groves, and is proportioned to the number of trees growing in each. The most magnificent palm-groves occur in the region called *Bledel Jerreed* (the dry country); their extent may be judged of from the fact mentioned by El Hadgee Shabeeny, that the fruit of one plantation alone is not unfrequently sold for 1000 dollars, producing 1500 camels' loads of dates, or 4500 quintals. 'On approaching Tafilelt,' says Jackson, 'we found the country covered with most magnificent plantations, and extensive forests of the lofty date, exhibiting the most elegant and picturesque appearance that nature on a plain surface can present to the admiring eye.'"

The palm produces male and female flowers on separate plants, the latter alone producing fruit. The flowers of the male plants which grow in the desert are hung or shaken over the others, the season said to be most favourable for so doing, being the end of February, or beginning of March, when it is also said, if the flowers are plucked in their ripe state, and cautiously dried, they will perform their office though kept to the following year.

"The uses of this tree are so numerous, that it alone seems almost sufficient for the wants of the tribes by whom it is cultivated, and as capable of supplying to them the place of almost every other vegetable production. Its fruit (the date), growing in immense clusters, weighing thirty or forty pounds each, when simply dried, forms a most delicious and nutritive food, abounding in saccharine matter. It may also, if still further dried by the heat of an ardent sun, be reduced into a kind of meal, which will keep for any length of time, and which thus becomes a most valuable resource to travellers crossing the sandy deserts, who frequently make it their only food, moistening a handful of it with a little water. The softer and riper dates are treated in a different manner; placed in earthen vessels perforated at the bottom, they are subjected to a strong compression, and the juice which exudes forms the date honey, which is both wholesome and delicious. Certain preparations are made of the flowers of the male plant, to which medicinal virtues are attributed; the younger leaves eaten with salt, vinegar, and oil, make an excellent salad; ropes are made, and vestments wove from the long fibres; the timber when hardened by age is used in building: the heart of the tree, which lays at top between the fruit branches, and weighs from ten to twenty pounds, is eaten only on grand occasions, and possesses, according to Tully, a most delicious flavour, between that of the banana and the pine-apple, while the trunk, if tapped, yields a cooling and refreshing beverage, called lakaby, perhaps the most grateful, when fresh, that can be drank in a tropical climate, and which, when allowed to stand, ferments and forms a very tolerable spirit."

The orange forms large groves in Barbary. The bitter sort grow wild, but the sweet requires careful cultivation, for which it returns the most abundant produce. These groves are represented as extensive and splendid, nay, as perfectly magnificent in some parts. What a glorious picture must the scene that is described in the following extract have been!

"In the neighbourhood of Bleeda the orange groves bear fruit but once a year; they blossom in the month of June; and on the 15th of November, when the French troops advanced on that city, they uttered an involuntary cry of admiration on coming suddenly in view of its groves laden with their rich golden fruit, which stood out in beautiful relief on the dark green of the foliage. 'We were,' says M. Rozet, 'an army of eight thousand men, every one of whom ate or destroyed, on an average, at least fifty oranges, making a total of four hundred thousand. Well, at our departure, the trees seemed as laden as at our arrival, and on our return a month afterwards with General Boyer, the inhabitants of Bleeda came to sell us oranges at twelve a penny.'"

The vine is also extensively grown. All the vineyards, however, were destroyed by a plague of locusts in 1723-4, and since that time authors say, the quality of the grape has been deteriorated. It is for grapes as a fruit, not as wine, that the vine is cultivated by the inhabitants of Barbary. One single tree is spoken of, which in 1831 bore three thousand bunches, each weighing not less than two pounds, which cer-

tainly exceeds our celebrated Hampton grape. The olive grows spontaneously in all parts of Barbary, but cultivation is required for obtaining its fruit in perfection. For these fine plantations the country is said to be indebted to the emperor Muley-Ismael, who, though a conqueror, made his armies, wherever they encamped, pursue some useful and extensive work—the plantations particularly in India, which are now so delightful for their shade and their fruit, being traced to this origin. These notices and the following still more brief particulars, must suffice, as regards Mr. Lord's account of the botany of the Barbary States.

"Fig trees grow universally in the hedges, from Algiers even to the southern declivity of the Atlas. Figs appear with the leaves, in the commencement of March, and are fit to eat in the month of June. Much of the fruit is never ripened, but becomes parched and rotten on the trees, by the scorching heat of the sun. The jujube-tree, the clove tree, and the almond tree, also adorn the hedges or gardens, where the lime, the citron, and the bergamot may also be found. The mulberry is cultivated, but merely for its fruit, which is excellent: the Arabs are too indolent to attempt rearing silkworms. The banana tree is not indigenous, but grows readily when planted, and ripens its fruit. Cypresses, acacias, hortensias, and other ornamental trees, grow in abundance. From one of the acacias the celebrated gum arabic is procured. The eurphorbium plant grows on rocky spots of the mountains, and the fashuk, a plant which yields the gum ammoniac is also discovered. Rice, with different kinds of corn, such as wheat, barley, millet, and panic, grow in abundance, yielding a much greater return than similar crops in these countries, while garden herbs and vegetables, onions, tomatos, peas, beans, lentils, garvenços, turnips, parsnips, beet, endive, cress, celery, together with musk and water-melons, cucumbers, gourds, &c. are to be seen surrounding every house which has any sort of enclosure meriting the name of a garden. The acanthus, or bear's-foot, grows commonly on the hedges, and the beautiful form of its leaf served, as is well known, for the model after which the Greeks formed the capital of their most ornate order of architecture. The squill plant is found in great abundance, both amongst the brushwood of the hills, but more particularly on the plain. In the month of August, its stalks may be seen rising to a height of four, five, and even six feet, covered with a profusion of white blossoms, so as when seen from a distance to bear no inaccurate resemblance to so many Berbers, wrapt up in their snowy burnooses.

"The henna plant, which the Arab and Moorish women employ so constantly in dyeing their nails and the palms of their hands, grows also in the Atlas, but the principal plantations of it, according to Shaw, are in the kingdom of Tunis, particularly at Gabs, or Tacape, on the sea-coast, where it is regularly cultivated in all the gardens, and sends forth clusters of small flowers, which yield a most grateful and refreshing smell, much resembling camphor. The leaves are the part employed as a dye, and for this purpose they are simply dried and reduced to powder, a little of which moistened with water produces the desired tint."

*Arboretum Britannicum; or the Hardy Trees of Britain, Native and Foreign, pictorially and botanically delineated, &c.* By J. C. Loudon. No. V. Longman. 1835.

THIS work, which is to be completed in twenty-four monthly numbers, with upwards of 300 octavo plates, and above 600 pages of letter-press, bids fair to supply a desideratum in the British system of rural economy, that will add to Mr. Loudon's already established fame, in the various branches of that extensive department. In the present number, we have some interesting information regarding the introduction of foreign trees and shrubs into this country; the account is peculiarly curious as regards Scotland, which shows how indefatigable Mr. Loudon is as a compiler. But, first as respects the trees and shrubs introduced into Britain during the 18th century—these amounted, as we are here informed, nearly to 500 hardy trees and shrubs, 108 being from the continent of Europe, 300 from North America, 3 from Chili, 13 from China, 6 from Japan, 2 from the Cape of Good Hope, 33 from Siberia, 2 from Tartary, 1 from Egypt, 2 from Morocco, 1 from Aleppo, 1 from Barbary, and the remaining few from Asia.

But to go back as regards North Britain during the 17th century—we find that very little was done, though the rudiments of this description of improvement are stated to have been laid in that country about the end of the era mentioned, by the establishment of the Edinburgh Botanic Garden.

Mr. Loudon has good authority to guide him in his researches regarding the progress of tree-culture in Scotland.

"It is fortunate for the historian of tree culture in Scotland, that such a writer existed before him as the late Dr. Walker, professor of natural history in the university of Edinburgh, This excellent man, whose garden we have seen in our younger days, at Collington, near Edinburgh, was ardently attached to the study of organised nature from his youth; and as he mentions in a letter to Lord Kaims, published in Tytler's life of that eminent man, more particularly to plants. Wherever Dr. Walker went, he seems to have paid peculiar attention to trees and plantations; and there are few works which contain sounder information on the subject than his *Economical History of the Hebrides and Highlands of Scotland*, published in 1812, nine years after the author's death, which happened in 1803. The facts, as to trees, given in this history, were collected, Dr. Walker informs us, between the years 1760 and 1786; and, as will appear from the following extracts, they are of very great interest.

"'The first trees planted by art in Scotland,' says Dr. Walker, 'were those of foreign growth, and especially the fruit-bearing trees. Long before the Reformation, various orchard fruits, brought probably from France, were cultivated in the gardens of the religious houses in Scotland. Some of these fruit trees, planted, perhaps, but a little before the Reformation, still remain. A few exotic barren trees were likewise propagated, such as the elder and the sycamore, and, at a later date, the beech and the chestnut; but none of our native trees were planted, such as the fir [pine], oak, ash, elm, and birch, till about the beginning of the last century. The first exotic tree of the barren kind planted in Scotland seems to have been the elder. Though a slow-growing and long-lived tree, many generations of it have succeeded each other in that country. Elder trees of a large size and very ancient date still appear; not only about old castles, but about the most considerable and oldest farm-houses. It was very generally planted, and for a very useful and peculiar purpose, the wood of the elder being accounted, in old times, preferable to every other sort for the making of arrows. The plane [sycamore, *Acer Pseudo-Platanus*], in point of antiquity, appears to be the next. When it was first introduced is uncertain; but it seems not only to have been planted, but to have been propagated by seeds and suckers, for several generations before any other forest tree was introduced into Scotland. The wood of this tree, in old times, must have been of great value in the hands of the turner; and for that purpose chiefly it seems to have been cultivated. It is better adapted for the wooden bowls, dishes, platters, and other domestic utensils which were universally in use, than the wood of any other native tree in the country. These, however, the elder and the sycamore, appear to have been the only two barren trees planted in Scotland, till towards the middle of the seventeenth century.'

"Perhaps the oldest sycamore in Scotland, and which appears to be at the same time the largest tree of the kind in Britain, is that at Kippenross, in Perthshire. In 1823, it measured 28 feet 9 inches in circumference, at a foot from the ground. It appears, from a statement made by the Earl of Mar to Mr. Monteith, that this tree went by the name of 'the big tree in Kippenross,' in the time of Charles II. In the

grounds of Callendar House, near Falkirk, there are sycamores and other trees of great size, which must have been planted at the commencement of the 18th century, if not in the latter part of the 17th century. Dr. Graham states, on authority which he considers almost approaching to a certainty, that these trees were planted by the Earl of Linlithgow and Callendar, who had accompanied Charles II. in his exile, upon his return from the Continent, after the Restoration.

"We are not aware of any elder trees in Scotland of any great size or indicating great age. The tree is so completely naturalised there, more especially about houses and places where cultivation has long existed, that, if it were not for Dr. Walker's statement, we should never have supposed it to be otherwise than an indigenous tree.

"The sweet chestnut and the beech, producing seeds easily portable from other countries, were in all probability introduced into Scotland by the Romans, and, perhaps, reintroduced by the religious establishments in the middle ages. According to Dr. Walker, 'a few chestnuts and beeches were first planted in gardens not long before the middle of the seventeenth century, some of which have remained till our own times. Such was the chestnut at Finhaven; another at Levenside in Dumbartonshire, which was thrown down by the hurricane in 1739; and two or three, which were alive and vigorous, at Kinfauns in Perthshire, in the year 1761. Such was the great beech at Taymouth, overturned by a storm some years ago; the beech at Oxenford; that at Newbattle in Mid Lothian; and another at Ormiston Hall in East Lothian.'"

One's heart warms and exults when hearing of, or seeing a gallant majestic tree; especially does a Scotchman cling to such ascertained specimens, since his country is apt to suffer from a species of disparagement that is proverbially used, and backed by the sneer of a certain great moralist. But to go on with the summary introduced into the Arboretum Britannicum.

"From this period (1770) the intercourse between Scotland and England became so frequent, that the dates of the introduction of foreign trees and shrubs into the two countries may be considered as merged into one.

"It would be interesting to know some particulars respecting the tastes and pursuits of the proprietors of the places mentioned in Dr. Walker's list; but at this distant period, we have been able to glean very little suitable to our purpose respecting them.

"Taymouth, in the central highlands of Perthshire, is a very old seat of the Campbells. Pennant says the castle was first built by Sir John Campbell, sixth knight of Lochow, who died in 1583. The place, he says, has been much modernized since the days of the founder, and has lost its castellated form, as well as its old name of Balloch Castle. The place has subsequently undergone a great variety of alterations, and at present is remarkable for the extent of its woods and plantations, and for a fine avenue of lime trees. The present proprietor is John Campbell, Marquess of Breadalbane.

"Inverary Castle was inhabited by a Colin Campbell before 1480; and is now the property of George William Campbell, Duke of Argyll. It is a magnificent place, from its great extent with the sea in front, being backed by woody hills and lofty mountains. The house is an immense quadrangular building, and with the plantations and pleasure grounds, are said to have cost, within the last half century, upwards of 300,000*l*. The Portugal laurel was introduced here in 1695, and is said to have been brought from Portugal by Duke Archibald; one tree spreads over a circle of 165 ft. in circumference, and is nearly 40 ft. high. In Smith's *Agricultural Report of Argyllshire*, the oldest and largest trees at Inverary are supposed to have been planted by the Marquess of Argyll (frequently mentioned by Evelyn as a great planter), between the years 1650 and 1660. Those of the next largest size and age were raised from seed by Archibald Duke of Argyll in 1746 or 1747. These latter consist chiefly of larches, New England pines, and spruce and silver firs. The soil and climate at Inverary are said to be remarkably favourable for the growth of trees.

"Prestonfield is a well known place in the neighbourhood of Edinburgh, which, in 1783, belonged to Sir Alexander Dick, a great horticulturist as well as agriculturist, and distinguished by having been the first to produce good medicinal rhubarb in in Scotland. Kinross was built and planted, about 1685, by Sir William Bruce, the celebrated architect, for his own residence, and was the first good house of regular architecture in Scotland. It was approached by a fine avenue of trees. Drumlanrig, in Dumfriesshire, was built by the Duke of Queensberry in a commanding situation: it took ten years in building, and was finished in 1689. The duke expended an immense sum in forming terraced gardens, which according to Gilpin, served only to deform a very delightful piece of scenery. The duke, he adds, seems to have been aware of his folly, for he is said to have 'bundled up all the accounts together, and inscribed them with a grevious curse on any of his posterity who should ever look into them.' The property now belongs to the Duke of Buccleugh and Queensberry, who is planting and building there very extensively.

"Hamilton Palace, in Lanarkshire, the ancient seat of the Dukes of Hamilton, was built at different periods; the most ancient part in 1501. The grounds were laid out in the year 1690. The gardens and lawns near the house were planted with foreign trees, especially lime trees, some fine specimens of which still remain. One of the earliest nursery gardens in Scotland, appears to have been established at the little village of Hamilton, close by the palace, being the only garden for the sale of plants mentioned by Reid in his Scots Gardener, published in 1683. Among the oaks of Hamilton Park, so famous down to the end of the seventeenth century, there were trees, Nasmyth informs us, which measured 27 feet round the trunk, with wide expansive branches.

"Panmure is the name of an ancient family in Angusshire, whose chief seat is the spacious and hospitable mansion of Brechin Castle, which, from the remotest period of its history, has always been possessed by the Maules, formerly Earls of Panmure. Panmure, another seat of this family, is near Dundee, and was built about 1665. It is a venerable fabric, and is kept by the proprietor, with all its furniture and pictures, in the same state in which it descended from his ancestors. In Dr. Walker's time, Panmure was famous for its laburnums, which were planted towards the end of the seventeenth century, and had attained a great size in 1780. Sang says that a considerable quantity of the laburnums at Panmure and Brechin were cut down in 1809, and sold by public sale at fully 10*s*. 6*d*. a foot, chiefly to cabinet-makers.

"New Posso, in Peeblesshire, was formerly called Dalwick, Dawick, or Daick. It belonged, in very ancient times, to the chiefs of a very considerable family of the name of Veitch; but, in 1715, it was in the possession of Sir James Nasmyth of Posso, an eminent lawyer, who rebuilt the house and garden, and by some ornamental planting added greatly to the beauty of the place. Pennicuick mentions that, in an old orchard near the house, the herons built their nests upon some pear trees, which were large and old trees in 1715. Armstrong, in 1775, says that New Posso, formerly called Dalwick, 'from being a lonely mansion in the bosom of a gloomy mountain, is now the extreme reverse. The vast improvements made by its present possessor have proved not only an ornament to Tweeddale, but a worthy example for emulation in the gentlemen of the county. The botanical and culinary gardens are justly esteemed the most copious in it; and the pleasurable attention with which they are cultivated, is sufficiently expressed on the front of the greenhouse, alluding to its flowers, 'Solomon in all his glory was not arrayed like one these.'"

Notices of the trees near the royal palace of the Scottish Metropolis, if pushed to an authentic source, would not, we fear, flatter the nationality of the people of that country; although,

when comparing their genius or wealth with the inhabitants of the south, Scotchmen are apt to do, as they did when Home's tradegdy of Douglas was first represented in their theatre, and recommended by Mrs. Siddons' Lady Randolph—they were so borne away with enthusiasm, as to call out, "Ye Englishers, what think ye of your Willie Shakspeare now?" But there are some places in Scotland that may well bear an account in respect of its trees and shrubs as well as its poetry and drama.

We pass over a number of notices regarding Andrew Heron, that we may have room to introduce something that goes to the honour of Scotland as respects its trees and its botanists or gardeners, a long time back, and a character which it has nobly sustained and enlarged ever since. The date inscribed on Andrew's tomb, is 1729.

"We visited Bargally in August 24, 1831, and found a number of the trees planted by Andrew Heron still in existence. Having applied to the present proprietor, John Mackie, Esq., for the dimensions of some of these trees, the following is an extract from his letter, dated Bath, March 21, 1835.—'I have now received the measurement of some of the old trees at Bargally, which is as follows, viz.: the circumference of a beech (usually denominated the large beech), at 18 inches from the ground, is 18 feet, and it is upwards of 90 feet in height This tree is in the most perfect health, and when in full foliage is truly magnificent. The circumference of an evergreen oak in the garden, at 14 inches from the ground, is 12 feet, and it is above 60 feet high; this tree is also in a very thriving state, and does not show the least tendency to decay. The circumference of a hop hornbeam (*O'strya vulgàris*), at 1 foot from the ground, is 9 feet, and it is above 60 feet high; this tree is particularly mentioned by Dr. Walker, as having been measured by him in 1780; it was then 4 feet 1 inch in circumference at 4 feet from the ground, 60 feet high, and considered the oldest and largest tree of the kind in Scotland. The circumference of a variegated sycamore is 12½ feet, and it is upwards of 70 feet high. The girt of a sweet chestnut, at 18 inches from the ground, is 10 feet 7 inches, and it is above 80 feet high. Mr. M'Nab, my factor, adds, 'Had I measured them at the surface of the ground, they would have been one third more, in consequence of the roots spreading so much as they do.' Mr. Hannay sold the property of Bargally to my father in 1792.'

"It is recorded of Mr. Heron that he went to visit a garden in the neighbourhood of London, and very much astonished the principal gardener, to whom he was a stranger, with the botanical knowledge he displayed; and the gardener having shown him an exotic, which he felt confident Mr. Heron had never seen, he exclaimed, on Mr. Heron's readily naming it, 'Then, Sir, you must either be the devil or Andrew Heron of Bargally;' thereby intimating that Mr. Heron was proverbial, in those days, as a botanist, even with those who had never seen him."

Many other Scottish estates are enumerated which are famous for their trees. But it is to be remarked, that many of the trees condescended on were only planted in gardens and pleasure grounds as objects of rarity or beauty.

"Planting on a large scale, for profit, was chiefly performed, as may readily be imagined, with indigenous trees. The father of this description of planting in Scotland was, according to the same undoubted authority, Thomas Earl of Haddington, who began to plant Tyningham, near Dunbar, in the year 1705. He enclosed 1000 acres, called Binning Wood, and wrote a *Treatise on Forest Trees*, which was printed in 1733. The earl died at New Hailes near Edinburgh in 1735, and was succeeded by his grandson, to whom he had addressed the letters which compose the treatise. The earl informs us in his treatise, that when he came to live at Tyningham, in the year 1700, there were not above fourteen acres set with trees. The earl's grandfather, he tells us, after the civil wars in the time of Charles I. were over, 'tried to raise some trees,' and for that purpose planted two rows round the house and gardens. The author of the treatise tells us that he was 'fond of dogs and horses, and had no manner of inclination to plant, till he was obliged to form some enclosures for grazing his horses, as he found the purchase of hay very expensive.' After he began, his lady, who 'was a great lover of planting, encouraged him to go on, and at last asked leave to go about it herself.' The first Marquess of Tweeddale, Lord Rankeilor, Sir William Bruce, his father, and some others, he says, had planted a great deal; yet, he adds, 'I will be bold to say, that planting was not well understood in this country till this century began. I think it was the late Earl of Mar that first introduced the wilderness way of planting amongst us; and very much improved the taste of our gentlemen, who very soon followed his example.' What the earl means by a wilderness, we afterwards learn, is a plantation with straight walks cut through it, in the geometrical style of landscape-gardening; in England, a wilderness plantation is generally understood to be one in which the walks are in irregular directions.

"It does not appear, from this treatise, that the earl planted many trees of foreign origin in his woods; but, from the dimensions of some arbor vitæs, evergreen oaks, chestnuts, &c., there can be little doubt that he did not lose sight of such trees in his ornamental plantations near the house. Sang, in the Planter's Kalender (2d edit. p. 551) mentions a silver fir as having been planted in Binning Wood in 1705. This wood, he says, 'reflects great honour on the memory of the *lady* who planted it;' meaning, no doubt, the Countess of Haddington above mentioned, who is said to have sold her jewels, to enable her to plant Binning Wood. The holly hedges at Tyningham planted by this earl and his successor are unquestionably the finest in Britain. Some notices respecting these hedges are given in the London Horticultural Society's Transactions, vol. iii, and in the Gardener's Magazine, vol. ii, p. 184. There are in all 2952 yards of holly hedge, in different lengths, of different heights of from 10 to 25 feet, and of widths from 9 to 13 feet: they are, with the exception of one, regularly clipped every April. The largest single holly at Tyningham, according to the dimensions sent us in January, 1835, was 42 feet high. The hedges were for the most part planted in 1712. Wight of Ormiston, in his General Survey of the Agriculture of Scotland, speaking of Tyningham, in 1768, says, these hedges, and the abundance of evergreens, give the place the appearance of summer in the midst of winter.

The great promoter of the planting of foreign trees and shrubs in Scotland appears to have been Archibald Duke of Argyll, and unquestionably also says Mr. Loudon, the greatest promoter of this kind of planting in England; communicating also the same taste to a number of his friends both in England and Scotland; planting becoming very general in the latter country between the years 1730 and 1760. But the nakedness of the land must have been, so far as the trees were concerned, very general down to a comparatively late period—a few elms, sycamores, and ashes, being all that sheltered and adorned some of the residences of the principal gentry. In speaking, however, of the manner in which the country has redeemed its character, not one of all the branches of gardening furnishes a more illustrious example than do its nurseries of trees.

## BOTANY OF THE ISLAND OF SUMATRA.

Rice, as in all the countries that lie near the equator, is a great article of consumption in Sumatra. Like wheat in our own temperate latitudes, it is the tropical "staff of life." It is probable that not less than fifty millions of the human family depend for their sustenance almost exclusively upon this farinaceous and esculent article of food. In India, rice is called, while yet in the husk, *paddee*; but acquires a different appella-

1. Bignonia grandiflora.

2. Tulipa sauveolens var latifolia.

tion from every process through which it passes. In Sumatra and the adjacent islands, this article is distinguished by the Malays as "upland and lowland paddee," a distinction, we believe, not unknown among the rice-planters of our own country. The upland rice, being of a superior quality and more durable, always commands a higher price; while the other, or lowland, is more productive, yielding a greater return; and though not so durable, or by any means so nutritious, is yet in more general use.

The plantations, or *paddee-fields*, are often prepared with great labour, in clearing away the aquatic shrubs with which the marshes or lowlands are generally overrun; while even greater efforts are required in removing the venerable groves which have shaded the mountains for ages. The fields are sowed in September or October, about the commencement of the periodical rains. When additional moisture becomes necessary, artificial irrigation is resorted to, which is easily effected, from the numerous little streams which intersect the interior of the island in every direction. When the rice begins to blossom, and form into ears, "sweet bashful pledges of delicious harvest, wafting their influence to the ripening sun," the water is carefully drained off; after which the crop rapidly advances to a state for the gatherer. In the district of Manna, and that occupied by the Battoos, the arts of cultivation are exercised in much greater perfection than in any other parts of the island; owing probably to the greater density of population, and the consequent necessity of industry. The crops yield variously in different parts of the island, but in none are they more productive than in the interior from Quallah-Battoo.

The cocoa-nut, nature's most bountiful gift to her rude children throughout the tropical world, is found in all parts of Sumatra; and, in one way or another, is extensively used by the inhabitants as an article of food; though, from the great variety of other productions, it is not actually indispensable, as is the case in some islands. Oil is extracted from it for moistening the hair, and also for burning in lamps; though in the interior of the island, lights are procured from a species of turpentine called *dammar*. From this and other species of palm, is also extracted a liquor used in the manufacture of arrack; while from the head of the same tree is procured a kind of cabbage. The villages are carefully surrounded and adorned with cocoa-nut trees, wherever the air and soil are favourable; while in the sea-port towns, where the demand is greater, the groves are proportionably larger. The soil best adapted to their growth is low and sandy, and near the sea shore, where they come to maturity and bear fruit in the course of a few years.

The *beetle-nut-tree*, greatly resembling in its appearance the cocoa-nut, is cultivated by the natives in large plantations, and is eaten with *see-see*, a creeping plant of a pleasant aromatic odour. Ginger and tobacco are raised in small quantities. The *palmachristi*, of which the best of castor-oil is made, grows here in great abundance, and without any trouble. Sugar is extracted from *anou*, a species ofthe palm. The natives plant a dwarf kind of mulberry for the use of the silkworm, but their silk is of an inferior quality. Sugar-cane is cultivated, though not to any great extent, and is chewed as a delicacy. They plant yams of various kinds, to the culture of which the soil is well adapted; likewise sweet potatoes and pulse, a species of French bean, as well as the egg-plant, probably introduced from China, all of which are much used for food. Maize is planted, and much eaten while green, but not relied on as an essential article of subsistence. The indigo, *taroom*, found on all their plantations, is used as a die-stuff: but is not in general prepared in solid pieces as we see in the southern ceroons. Dicwoods of various kinds, some of which are very valuable, are found on the island, with the virtues and qualities of which the natives appear to be well acquainted.

No portion of the globe can probably boast of so many indigenous fruits as the Malay islands. Here nature, in liberal profusion, has poured forth her most delicious productions. The mangusteen—how shall we describe it? The pride and boast of India! Where shall we find language that will convey to those who never tasted it, an idea of its inexpressible delicacy; —unlike, as it is unequalled, by any fruit in the world? It is a drupe, consisting of a soft, succulent, and thick rind, encompassing kernels, which are covered with a juicy and perfectly white substance, that dissolves in the mouth. It is so innocent in its effects, that it may be partaken in any quantity, without danger.

There is another fruit called the *doosean*, of which the natives are extremely fond, and subsist on it almost entirely during its season. This is a rich fruit, grows on high trees, and not pleasant, either in flavour or odour, to those who are unaccustomed to it. Besides those already mentioned, and various other fruits found on the vine, the shrub, or the trees of the forest, there are mangoes, Indian figs, bananas, pineapples, oranges, limes, and lemons, in abundance; also, pomegranates, melons, water-melons, tamarinds, and grapes, though in limited extent; the latter grow wild, and are scarcely cultivated at all.

## DESCRIPTION OF THE PLATES.

### BIGNONIA GRANDIFLORA.

LARGE FLOWERED TRUMPET FLOWER.

Class. Didynamia Angiospermia, Linn.

Nat. Ord. Bignoniaceæ.

*Stem* comprest, and climbing luxuriantly, if not confined in a pot. *Leaves* pinnate, with an odd leaflet. *Petiole* at the base, and leaflets somewhat kneed, with their margins frequently winged by a membrane, bearded between the leaflets. *Leaflets* ovate, serrated, acuminate, rough, with rudiments of minute bristles especially on their upper surface, the lateral ones hollowed out more on one side than the other, toward the base. *Flowers* in a large terminal panicle. *Peduncle* more angulated than the stem, its branches first opposite, then dichotomous, with an odd flower in the middle. *Bracteas* falling off long before the flowers expand. *Pedicels* round. *Sorus* like the nave of a wheel, smooth. *Calyx* an inch and a half long, angulated, resembling that of many *daturas*. *Corolla* pale orange on the outside, deep orange-scarlet within, especially the nerves and bottom. *Tube* very short, projecting externally at the insertion of the barren filament into a bristle. *Limb* widely funnel-shaped. *Barren filament* very small. *Anthers* inserted near the top. *Nectarium* saucer-shaped, ten-lobed. *Stigma* finely torn or ciliated.

The *Bignonia grandiflora* is an extremely ornamental shrub, is easily propagated by cuttings. It is considered as a greenhouse plant, and is observed to flower more freely, when forced by artificial heat. It is not improbable, however, that it may be found to be sufficiently hardy to bear our winters without shelter, being a native of Japan and China.

### TULIPA SAUVEOLENS.—Var. LATIFOLIA.

Hexandria Monogynia, Linn.

Nat. Ord. Tulipaceæ.

*Root* bulbous, about the size of a walnut, clothed with a smooth brown scale, and terminated at the base with a dense fascicle of small white fibres. *Leaves* stem-clasping, strongly veined, and densely clothed with a short close mealy pubescence; lower ones oblong; upper one lanceolate. Scape shorter than the leaves when the flowers first expand, but afterwards lengthening beyond them, and clothed with a white mealy pubescence. *Perianthium* of six leaflets, three outer acute, three inner obtuse; they are all mucronate and various in colour. *Germen* obtusely, trigonal stigma three-lobed, sessile, fringed round the edges.

A very ornamental plant, requiring the same treatment as the more common species, succeeding well in a light rich soil, and very proper for forcing in pots, as they come in flower early; as soon as they have done flowering, and the leaves are beginning to fade, the bulbs should be taken out of the ground, and kept dry till spring.

## BRYOPHYLLUM CALYCINUM.

LARGE-CUPPED BRYOPHYLLUM.

Octandria Tetragynia, Linn.

Crassulaceæ, Juss.

Gen. Des.—*Sepals* four; *petals* four; connate into a cylinder; *seeds* many.

Spec. Des.—*Leaves* oval, crenate; *flowers* long, pendulous, cylindrical.

This singular plant is a native of Bengal. It flowers in May. The flowers of a greenish-purple colour, are produced in terminal compound panicles. This plant possesses the singular property of germinating from the dark spot observable at the base of every indentation in the margin of the leaf, not whilst growing, but as it decays. Introduced 1800.

It requires very little water, and the pot to be well drained; it should be kept in a moderate stove. It flowers best plunged into a tan heat. Propagated by the crenatures of the leaves or by cuttings. A rich loamy soil suits it best.

## BORBONIA CORDATA.

HEART-LEAVED BORBONIA.

Monadelphia Decandria, Linn.

Leguminosæ, Juss.

Gen. Des.—*Stigma* emarginate; *calyx* acuminate, spiny; *legume* mucronate.

Spec. Des.—*Leaves* cordate, many nerved, entire.

The stalks are slender, and covered with white bark. Leaves stem-clasping, and terminated by sharp points, like those of ruscus, or butcher's broom. The flowers are produced in small clusters at the ends of the branches, and are of a yellow colour. Calyx five-cleft, nearly regular, hirsute, with spiny segments. The whole corolla is tomentose on the outside. Introduced 1759.

## BEGONIA NITIDA.

SHINY-LEAVED BEGONIA.

Monœcia Polyandria, Linn.

Begoniaceæ, Juss.

Gen. Des.—MALE.—*Calyx* 0; *petals* four; the two opposite the largest; *stamens* numerous. FEMALE.—*Calyx* 0; *petals* 4-6, like the male; *styles* three, bifid; *capsule* inferior, three angular, winged, three celled, many seeded.

Spec. Des.—*Leaves* very smooth, unequally cordate, obsoletely toothed; wings of capsule very large, roundish.

The whole plant is smooth. Stems almost upright, branched. Branches alternate, cylindrical. Leaves seven-nerved, one lobe of the base is double the size of the other. The younger leaves are rose-coloured about the edge; they are all very smooth and shining, of a bright green above, paler beneath. They are five inches long, and three broad. Racemes compound, the males very numerous, the females few at the top, solitary, axillary, caducous. Corolla, flesh or rose-coloured, sometimes of a darker red: in the female flowers, six-petalled.

## ANAGALIS ARVENSIS.

COMMON PIMPERNEL.

Pentandria Monogynia, Linn.

Primulaceæ, Juss.

Gen. Des.—*Capsule* one-celled, cut round; *corolla* rotate; *stigma* capitate.

Spec. Des.—*Stem* procumbent; *leaves* three-nerved, ovate, lanceolate; *petals* dilated at end, crenate with glands.

The common Pimpernel continues to give out a succession of blossoms, from the month of June to the end of September, and is, although a native weed, deserving of a situation on the parterre, its flowers being of a fine yellow scarlet, having a purple circle at the eye, which adds considerably to the beauty of this miniature flower; and as it is a delicate pretty flower, that we love to see in the small parterre, or on the banks or borders of the larger pleasure garden, we shall observe that it may be increased by cuttings, and when planted in a pot of light earth, and placed in a hot-bed, it will produce flowers in about six weeks.

## AMYGDALUS COMMUNIS.

COMMON ALMOND.

Icosandria Monogynia, Linn.

Amygdalineæ, D. Don.

Gen. Des.—*Calyx* five-cleft; *petals* five; *drupe* with a neck perforated on its surface.

Spec. Des.—Lower serratures of the leaves glandular; *flowers* sessile in pairs.

The common Almond will grow to the height of near twenty feet, with spreading branches. The leaves resemble those of the Peach, but the lower serratures are glandular; they proceed from buds both above and below the flowers, and not as in the Peach from the ends of the shoots above and not below the flowers. The form of the flowers is not very different, but they usually come out in pairs, and vary more in their colour from the fine blush of the apple blossom to a snowy whiteness. The chief obvious distinction is in the fruit, which is flatter, with a coriaceous covering, instead of the rich pulp of the peach and nectarine, opening spontaneously when the kernel is ripe. The shell is never so hard, and is sometimes even tender and exceedingly brittle; it is flatter, smoother, and the furrows or holes are more superficial.

In raising trees of this kind from the stones, it is best to plant them in the early autumn or spring months, as October and November, or February and March, being careful to choose those of the last summer's growth, drilling them in, in a bed of good light ground, two or three inches in depth. The plants appear in spring, and in the autumn or spring following, may be transplanted into the nursery, and put in rows for the purpose of being trained for standards, half-standards, or dwarfs, according to the intention of the planter.

## ASCLEPIAS INCARNATA.

FLESH-COLOURED SWALLOW-WORT.

Pentandria Monogynia, Linn.

Asclepiadeæ, Juss.

Gen. Des.—*Corona* five-leaved, with a process on the inside; pollen masses fixed by a fine end; *stigma* depressed, blunt.

Spec. Des.—*Leaves* lanceolate, smooth; *stem* divided upwards; *umbels* erect, in pairs.

This puts out several upright stalks, about two feet high; at the top are produced close umbels of purple flowers; these appear in August, but are not succeeded by seeds here. It first came from Canada, but has since been found growing naturally in several other parts of America, in swamps, and on the banks of rivers.

The flowers possess a fragrance that seems to have some resemblance to that of the Peruvian Heliotrope.

## ACACIA VERA.

EGYPTIAN GUM ARABIC ACACIA.

Polygamia Monœcia, Linn.

Leguminosæ, Juss.

Gen. Des.—*Flowers* polygamous; *calyx* four-five toothed; *corolla* four-five cleft, or formed of four or five petals; *stamens* 10-200; *legume* bivalve.

Spec. Des.—*Spines* stipulary, in pairs, linear awl-shaped; *leaves* doubly pinnate; first division of five or six pair; second of many pair; common stalk glandular; *heads* axillary, about three together; *legume* necklace-like, nearly flat, smooth.

This tree arrives at a large size in countries where it grows naturally, but in England is rarely seen more than eight or ten feet high. It has the habit of *Acacia Senegal*, but differs in having the bark by no means white, but purple. It is the plant which affords the finest gum Arabic of commerce, and was originally referred by Linnæus to the extensive genus Mimosa, under the title of Mimosa *nilotica*. It is a native of the sandy deserts of Arabia, Egypt, and the western parts of Asia; and, according to Mr. Jackson, grows abundantly in Barbary, and other parts of Africa. The original gum Arabic tree was known to the earlier botanists, and appears to have been cultivated by Gerard in 1569; but few persons are acquainted with living, or even dried specimens, especially of the legume.

3. Begonia nitida.

4. Bryophyllum Calycinum.

5. Borbonia Cordata.

6. Anagallis arvensis.

7. Crysanthemum Indicum.

8. Amygdalis Communis

9. Asclepias incarnata.

10. Acacia vera.

*The Gardener's Dictionary; containing the best and newest methods of Cultivating and Improving the Kitchen, Fruit, and Flower Garden, and Nursery; together with directions for Propagating and Improving all sorts of Timber Trees.* The Ninth Edition. By Philip Miller, F.R.S. In 4 vols. Vol. I. London: Henderson. 1835.

THIS work comes most opportunely in the gay season of flowers —"the leafy month of June," as Coleridge calls it, when every hedge is white with blossoms and every field is decked in the rich garniture of summer. Indeed, with the "Gardener's Dictionary" for a companion—which speaks of every vegetable production, "from the cedar of Lebanon to the hyssop which groweth on the wall"—we could range with enthusiastic delight through groves and gardens, in the pathless forest, the broad savannah, or the mountain glen, and could find "society where none intrudes," in the sweet companionship of flowers, from their earliest germ to the full expansion of their beauties in the summer's sun.

There are two ways in which the study may be pursued, and one of these, the study of botanical prints and drawings, has little chance of coming into disrepute so long as the arts continue to advance, as they are now doing, in accuracy of design and brilliancy of execution. In this way, by having a numerous collection of good engravings, and descriptions of them, such as the work before us amply supplies, it is quite possible to learn and know a great deal of botany without ever seeing a living flower, or without experiencing the delight of a botanical excursion in the country.

The latter, however, is the true and only genuine method of studying the science; and in this way it is indeed a most delightful and elegant pursuit. We speak from the recollections of twenty years' experience, when we say, that among the brightest pictures of our past pleasures, are those of our summer wanderings in search of plants and flowers. The pursuit creates a keenness and enthusiasm of mind, which to others appears little short of folly, though it gives the botanist himself the enjoyment of the most innocent pleasure, and makes his hours pass on brightly and smilingly. And what cares he if the world call him foolish and mad, and talk of his dearest treasures as vile and worthless weeds, and of his rare mosses as mere toys for the nursery? He can say the same of the amusements, the pleasures, and even of the serious pursuits of the world. He can say, that while he admires the beauty of a flower, and the perfection of its structure, others admire the glittering of a gilded star or a jewelled coronet, and are seemingly no less mad than he, in the pursuit of such gewgaws. He can say, that while he spends his hours in admiring the workmanship of God in a blade of grass, or in the flower of a lily, others spend their hours in studying the inferior works of man, in painting and in poetry; and he can speak as neglectingly, and look as coldly upon their collections, by this master, and the other master, as they can do on his cabinets and herbariums, in which there is nothing but what has been planned by the highest wisdom, and executed by the highest skill.

We have put the case strongly. We think each party wrong to undervalue the studies of the other; for, after all, our highest pleasures and enjoyments, when coolly considered, are but little removed from the pleasures and enjoyments of infancy, and the pursuits of childhood; it is enough for us, if in infancy, as in manhood, the pursuit give pleasure; it is enough, if it help us in this world of care, to pass, at least, a few of our hours, or days, or weeks, in contentment and happiness; and this, the pursuit of botany is well fitted to do, if entered upon with keenness. One source of enjoyment it most amply supplies; we speak of health. The genuine botanist must be frequently abroad in the fields—he must wander through meadows, trace the course of streams and rivers, make his way through woods and thickets, and the depths of forests—he must clamber among rocks, and ascend mountains, and even fathom lakes, rivers, and seas; and if he do all this to become a botanist, he must take the best, and the most healthful exercise. In this view, the study of botany, in many of our most refractory diseases, would be more efficient than the best prescriptions. It is in vain, indeed, to talk of making an invalid take exercise, when he has nothing out of doors to do; and in fact it is found, when exercise is thus recommended or prescribed, it is usually neglected one day in three. But give the invalid a motive, make him study botany, and his daily walk and his daily exercise are insured. Besides, this will keep the spirits delightfully alive, it will rouse the mind, put the thoughts in play, and expel most of the diseases of indolence, gormandizing, and luxury, over which regularly prescribed exercise will have a feeble influence. The study, in fine, when keenly pursued, throws an interest upon every rural walk, and causes the summer fields to bloom more brightly, and the summer sun to shine more charmingly, than they can do to him who calls every flower a weed, and every nosegay a nursery toy.

If a botanist confine the range of his excursions, he must remain contented with a confined knowledge of plants; for like certain species of animals, certain species of plants have a tendency to live only in particular places. Some sorts of moss, for example, will only live and thrive in marshy ground, where they may always have abundance of moisture; and out of this they will wither and die, in the same way as the duck can only live and thrive where there is water to dabble in, and will pine away when deprived of it. There are other species of moss, which are never found except on the loftiest pinnacles of mountains; they can only live where they enjoy the mountain air, and the botanist, who is not enterprizing enough to scale the craggy cliff, and brave the perils of an Alpine storm, can never enjoy the supreme pleasure of seeing the *Andræa Nivalis*, the *Gymnostomum Lapponicum*, and the *Dicranum montanum* in their native abodes, and must be contented to take his information at second hand, from the happy man who has set every discomfort at defiance, for the delight of filling his plant-box with Alpine mosses.

To every body except a genuine botanist, such an enterprize appears little better than infatuation. Yet we can well understand why a rational and intelligent man should travel hundreds of miles to see the Scottish mountains, or the Swiss Alps, and have his mind elevated and his fancy enlarged, by ascending to their summits and looking abroad to the far horizon, which encircles whole countries and kingdoms in its widening sweep. We can well understand the pleasure, the dreadful pleasure, of the enterprizing aëronaut who fearlessly surrenders himself in his atmospheric ship to sail along the sea of clouds that encanopies the earth, and hides it from his view, and with nothing above him but the boundless firmament, and nothing around him but the viewless air, he cradles himself at his ease, and enjoys the unbroken solitude of his lonely situation. But the uniformity and sameness of this scene of sky and of air soon become wearisome, and he watches with restless anxiety for some parting or disseverment of the clouds below him, through which he may catch a distant glimpse of the earth, and through which he may descend in safety from his excursion through the fields of air. We can well understand the delight with which this man will chronicle his enterprize, and with which he will expatiate on the details of his aërial voyage, and we can easily fancy how he will tell of his hair-breadth escapes, of being involved in a thunder cloud, or lost in the wilderness of a fog, or of being dashed on some mountain summit, or precipitated headlong into the sea; and how eagerly his friends will listen to the wonderful narrative, and treasure up all his descriptions for the purpose of detailing them to others. All this we say, can be well understood, because it is one of the highest pleasures of human nature to be kept on the rack of suspense; and both the actual feeling and the narrative of its progress will impart this pleasure.

But there is another pleasure which is little less intense—the pleasure of being distinguished from every body else—the pleasure of having done, or of having seen what nobody else, or but

a chosen few have done, or have seen, or of possessing what nobody else possesses; all of which are only modifications of the high pleasure of individual distinction.

Now it is precisely on these principles that we must account for the pleasure of the botanist. He climbs the mountains, though it is not for the extent of view that he does so, nor to tell the history of his exploits in scaling cliffs and describing precipices, nor to display his taste in the descriptions of Alpine scenery, with its mountain ruins, and deep valleys, and fields of everlasting snow, which the summer sun cannot penetrate. The genuine botanist who climbs a mountain, has no leisure and no wish to look farther than the rock he is climbing, or the soil he is walking over. It is there alone where his treasures are to be found, and if he chance to light on a rare, or an unknown moss, he would look with a cold indifference on the most sublime scenery which might be spread before him, and at his return he can probably tell you nothing of mountain ridges, nor profound valleys, nor of the grandeur of an extensive prospect; but he will become eloquent and animated when he exhibits the riches of his plant-box, and will tell you, that he alone has had the high merit of discovering this and the other moss, or lichen, or jungermania, and he leaves the descriptions of the scene where he gathered them, to sentimental tourists and florid romance writers.

The botanist is in this exactly similar to the enthusiastic collector of old books, and of old coins, not for any utility which these possess, but because he is eager to have what nobody else has, and to be distinguished for having a unique collection, and to have his curiosities visited and wondered at, and talked about. The child, who gathers a daisy or a marigold, enjoys not half the pleasure when it has no one to shew it to, and every child is so far a botanist; for the most eager moss hunter would soon relinquish his pursuit were he to find nobody to admire his collection, and nobody to whisper that he was a first rate botanist—such is human nature, and such are the transitory sources of our highest pleasures.

But there are other and more interesting points of view in which we can contemplate botanical studies; for example, in reference to mineralogy, zoology, and similar branches of science. One of the most obvious analogies which strikes an observer is, that some plants and some animals always delight in solitude, and only a solitary individual of such a species is now and then met with at a distance from all others of the same kind. In animals we can more clearly see the design of this, than in vegetables. We can see the motive of the eagle in establishing his solitary throne on the summit of a precipice, and permitting no intrusion within his boundaries; but we cannot see the reason why the mountain ash is the only tree which has rooted itself in the cliff, while thousands of hazels and birches are flourishing on the bank below, and thousands of pines on the mountain above. Yet me may plausibly enough conjecture, that the different species of grass delight in society, because thus the food of graminivorous animals becomes more abundantly supplied. May it not be for the supply of abundant fuel, that the fine forests of Norway extend over such vast tracks of country; and may it not be to supply the rein-deer of Lapland with food, that the lichen on which they feed is so abundant under the snow?

It has been remarked of animals, that they are prolific in an inverse proportion to their size, and in a direct proportion to their utility. The eagle, for example, has only two eggs, and builds once a year. The rule, however, is not general; for while the wren and the tom-tit have eight or ten eggs, the humming bird has only two; and while the cat and the sow are very prolific, the cow and sheep have but a scanty progeny. We cannot, therefore, it appears, build much on this analogy in vegetables. The slightest observation indeed will contradict it; for the poppy, which is of small utility compared with wheat, outstrips it a hundred fold in productiveness.

From observation we know, that only certain species of plants grow wild in certain countries, and certain districts of countries, though these are often, for the purposes of utility or ornament, taken to distant parts and cultivated. Dr. Haworth, a distinguished English botanist, in his work on the Saxifrages, thinks that on these principles the botanist may be able to assist the antiquary, in tracing the situations of ancient towns and villages, by the exotic plants remaining long after the desolation of the ruins where they grow; and he fancies that even the early migrations of the human race may be faintly followed by the plants which they have left in their wanderings. We confess, we were at first rather sceptical with respect to this speculation of Mr. Haworth's, till we met with an instance of its practical application in Dr. Della Cella's Travels in Barbary. On arriving at a certain spot between Egypt and Tripoli, a mortality broke out among the camels of the caravan, which Della Cella immediately traced to their eating of a poisonous plant. From investigating the history of this plant, he ascertained that it was the celebrated sylphium of the ancients, which was sold for its weight in silver, and was deemed of so much importance, that it was kept in the public treasury, and sold for the service of the state, by order of Julius Cæsar, when making preparations for war. Now this plant was so difficult to rear, that we are told by Pliny, it would not bear transplanting, and would only grow in one district of Cyrene. In the time of the Emperor Nero, it had been so much in request, and so much destroyed, by the incursions of barbarians, that it was difficult to procure a specimen as a curiosity. Dr. Della Cella found it in abundance, and proved its identity by the figure of it, which is stamped upon one of the Cyrenéan coins. Such, we think, is a very fair specimen of botanical antiquities.

We shall here suggest that the same principle may, perhaps, be applied in our own country. It is remarked by botanists, that vervain is only found in the neighbourhood of towns and villages; and we infer from this that the vervain may be a foreign plant, introduced by the Druids into England, for religious purposes. Now, we ask, might not the vervain, if found at a distance from any town or village, serve to indicate their former existence, or, at least, point out the situations of some ancient Druidical grove, or temple? We do not say that the vervain alone would prove this, but it might serve to confirm other proofs, or strengthen probable conjectures.

We have to remark, that Mr. Haworth cannot claim all the originality of the principle; as the author of the "Pleasures of Hope," who has too much poetry in him to be a botanist, well illustrates the subject in his pretty verses on visiting a scene in Argyleshire.

"Yet wand'ring I found in my ruinous walk,
By the dial stone aged and green,
A rose in the wilderness left on its stalk,
To mark where a garden had been;
Like a brotherless hermit the last of his race,
Alone in the silence of nature it drew
From each passing sunbeam a lonely embrace,
For the night-weed and thorn had o'ershadow'd the place
Where the flowers of my forefathers grew."

We may, perhaps, apply the same mode of inquiry to the geographical discussions respecting the situation of ancient Troy. We have all heard of the river Scamander, which is mentioned by Homer; now M. Choiseul and other travellers have not been able to find at present anything like a river in the Troad, though there is still a brook, which is supposed to be the remains of the river. One explanation of this is, that the forests of Mount Ida have been for ages cut down, and the sources of the Scamander have in consequence been dried up. Take another illustration from Volney's account of America. It is a fact, well established in Kentucky, that many of the streams have become more abundant since the woods in the neighbourhood have been cut down; for it appears, that formerly the leaves of the forest trees accumulating on the ground, formed a thick compact bed, retained the rain water on its surface, and allowed it time to evaporate before it could penetrate

the ground; while now, the ground being opened by cultivation, suffers the rain to penetrate, and thus keeps it in more regular and abundant reservoirs. This, it will be said, is directly contrary to what has just been remarked of the Scamander being diminished by the cutting down of the forests on Mount Ida. But a distinction is to be made here. It is only in the plain country of Kentucky, that the clearing of the woods increases the rivers; for the clearing of the heights diminishes the quantity of rain by diminishing the attraction for the clouds; and in Kentucky accordingly, many brooks are pointed out which now become dry in summer—a circumstance quite unknown fifteen years ago; and in New Jersey, others have disappeared altogether.

We can carry the subject of botanical antiquities still farther, for we find abundant remains of plants imbedded in our rocks, and particularly in the black slaty rock called Shale, which usually accompanies coal-fields; and still more beautifully delicate ones in the species of Chalcedony, called Mocha stones. These, however, only refer us to the indefinite period connected with the deluge and the revolutions of the globe. They point not to any precise date which might aid us in the chronology of the earth's antiquities. Yet still they are useful in determining the relative ages of rocks. We have, however, met with something more definitive than this in the late researches of a continental geologist, Dr. Karg of Æningen, on the Rhine. Dr. Karg found imbedded in the lime-stone rocks at Æningen, the shoots and leaves of the black poplar, which is still abundant in the neighbourhood; and several shells which were also found in the same stone, appeared to be of fresh water origin, and recent. Now when it is recollected that most of the plants and animals found in rocks are such as are at present unknown, in a recent state, the limestone of Æningen, it would appear, has been formed at no remote period, that is, it seems to have been formed at least much later than the deluge. This is proved almost to demonstration by the striking fact, that walnuts and branches of the walnut tree are found enclosed in the rock. Now it is known that the walnut does not grow naturally in Germany, and that it was first brought from Armenia by the Romans, and introduced into Italy, whence it was taken to Germany, and the rest of Europe. The lime-stone rock of Æningen must therefore have been formed after the introduction of walnuts into Germany. There is no resisting the conclusion, if the accuracy of Dr. Karg's observations be admitted, and we have no reason to distrust them, as they are confirmed by Von Buch, whose authority is still higher than Dr. Karg's, from his being better known. We shall make one other similar remark, respecting the study of antiquities, as derived from the observation of wild animals. Captain Beaufort, in his excellent account of Karamania, mentions that near Patara he found immense numbers of partridges. Now this country was in ancient times famous for its partridges, and it is also said to have been extremely populous. Mr. Beaufort found the partridges exceedingly shy, although they must be little molested, as the country is at present almost a desert. May it not be that this shyness arises from a hereditary habit, transmitted from the ancient partridges when the country was populous?

But we must apologize for digression. We think the reader will excuse us for thus giving an example of the very close connection which subsists between branches of study apparently unconnected and opposite. It is impossible, indeed utterly impossible, to be profoundly skilled in one branch without making repeated excursions through all the diversified fields of human inquiry, at least, so far as they are connected with the branch pursued. We started, as may be recollected, with the illustration of antiquities from the study of botany, but we could not proceed far in the illustration, till we were involved in the knowledge of medals in meteorology, and the laws of evaporation, and with facts bearing upon the natural history of the origin of rivers, and the effects of clearing a country of forests. On going farther with our illustrations of botanical antiquities, we were obliged to dip a little into geology, and the natural history of petrifactions; and by continuing our researches, we should, we have no doubt, have had occasion for many more side glances at sciences and literary inquiry, which though at first they might appear remote, would in the end come to bear closely on the subject under review.

Now we would ask, is it not more philosophical, and more natural, and more interesting, to illustrate a science in this way, than by keeping rigidly and closely to its own dry details, and by shrinking back from the desire to travel beyond its own narrow circle? We could easily have told our readers the botanical characters of sylphium or of vervain; how the flowers are constructed, and how the leaves are shaped, and how each of them stands in the arrangement of Linnæus, or of Jussieu. This is all that the mere botanist ever thinks of, though it appears to us that his knowledge is totally useless, unless it be applied to illustrate some fact similar to what we have now given, or applied to some practical purpose. What would we think of an astronomer who merely knew the names of his quadrants, and his telescopes, and his micrometers, and who could not make a single observation to ascertain his latitude; or of a grammarian, who would repeat you off whole pages of rules and paradigmas, without being able to write one sentence grammatically? Yet precisely similar is the mere name knowledge of the self-called botanist, who spends his time in framing barbarous Latin, and in constructing unnatural systems.

Varied illustration, derived from every resource which can be commanded, is exactly conformable to what we find in nature, for there all things are linked together by inseparable relations, and it is only the imperfection of human systems which makes and maintains the breach among the sciences, somewhat in the same way as the French critics have done in dramatic poetry, banishing everything that is natural and easy, for a formal, stiff, artificial awkwardness, to which everything must be squared and levelled down. This appears to us to be exactly of a piece with the botanist who keeps himself rigidly to his system and his names; but we must confess that we should prefer the natural variety of our English theatre and our English novels, where we meet with human beings as we see them in the world—one grave and solemn, and another simpering out the sentimentalism of affectation—as we should prefer the botanist who could travel out of the circle of his system, and take interest in all the diversified phenomena of nature, at the very least in so far as these might illustrate his favourite subject, in the same way as the dramatist and the novelist set off the characters of their principal personages by introducing subordinate performers. Don Quixote would be a tiresome narrative without Sancho; as the Linnæan botany is certainly tiresome where it is unaccompanied with useful illustration. Our readers would scarcely believe us were we to tell them the puerilities of some botanical system makers, and among others we have to mention the great Linnæus himself, who expressly stated that he divided his "Philosophia Botanica" into twelve parts, because there are twelve months in the year; and into 365 paragraphs, because this is the number of days in the year. He also divided plants into five groups, because, as he tells us, we have five fingers on each hand, and five toes on each foot. The names of these five groups are, Classes, Orders, Genera, Species, and Varieties. He became dissatisfied, however, with this analogy of plants to the toes and fingers, and he intended, had he lived, to have added two more, namely, Legions and Tribes, to make up the number seven; because the world was created in seven days!!!

In the "Gardener's Dictionary" we find none of these puerilities. The plan is to follow up the brief botanical description of a plant, with remarks on the methods employed in cultivating it, and the various uses to which it may be applied. For example, after describing botanically upwards of one hundred species of garlick (*allium*) we find the following remarks upon the most important of these:—

"ALLIUM (from the Celtic *all*, which signifies hot or burning. This is a genus of strongly scented plants, all of them edible, and some of them of the greatest antiquity as pot-herbs).

"Class 6.—1. Hexandria Monogynia.

"Nat. Ord. *Spathaceæ*, *Asphodeleæ*, Juss.

"The Characters are—*Flower* six-parted, spreading, spathe many-flowered; *umbel* clustered.

"STEM LEAFY, LEAVES NOT FISTULAR; *Umbel* not bulbiferous; *leaves* flat.

"ALLIUM AMPELOPRASUM (great round-headed garlick). Eng. Bot. 1557. *Umbel* globose; *stamens* three-cusped; *sepals* with a rough keel.

"The stem is solitary, four or five feet or more in height, having leaves at the bottom, eighteen inches or two feet long, glaucous and succulent: the spathe is conical, one-leafed, and deciduous; it flowers in a close ball on peduncles which are about an inch in length: the stamens are somewhat longer than the corolla, which is of a pale purplish colour. The whole plant has a strong disagreeable garlick smell. It is eaten along with other pot-herbs; it communicates its flavour to the milk and butter of cows that eat it; it grows naturally in the East, in Switzerland, on the Holms island in the mouth of the Severn, &c.; is perennial, and flowers with us in July.

"ALLIUM PORRUM (the leek), Blackw. t. 421. *Stamens* tricuspidate, *root* tunicated. The leek may be said to be an annual-biennial plant, for although the roots often survive, after perfecting seeds, yet the plants always attain perfection the same year they are sown, and the year afterwards run up to stalk and become unfit for use. The seed-stalk of this plant does not belly like that of the onion. It flowers in close large balls on purple peduncles, in April or May. The stem or scape is three feet high or more, leafy at bottom. Leaves an inch wide, with the edge smooth, shortly conical deciduous.

"Tusser, in his verse for the month of March, says—

> "'Now leekes are in season, for pottage full good,
> And spareth the milch cow, and purgeth the blood:
> These hauing with peason, for pottage in Lent,
> Thou spareth both otemel, and bread to be spent.'

"Gerard, who wrote soon after this time, mentions leeks in such a manner as to induce us to think them indigenous to our soil: he says 'leeks are very common every where in other countries as well as in England.' And they appear to have been used by the Welsh as far back as we can trace their history.

> "'March, various, fierce, and evil, with wind-crack'd cheeks,
> By wilder Welshmen led, and crown'd with leeks.'

"The Welshmen still continue to wear leeks on St. David's day, in commemoration of a victory which they obtained over the Saxons in the sixth century, and which they attribute to the leeks they wore by the order of St. David, to distinguish themselves in the battle. This Welsh patron, who died about the year 554, governed the see of St. David's sixty-five years, having founded several monasteries, and having been the spiritual father of many saints, both British and Irish.

"Some authors affirm that the symbol of the leek, attributed to St. David, originated in the custom of Cymortha, which is still observed among the farmers of the country; where in assisting one another in ploughing their land, they bring each their leeks to the common repast. Leeks require a richly manured ground, and will not prosper in wet situations: their qualities are nearly the same as those of the onion and garlic, and they are best when used in moderation.

"The best of the varieties of this plant for general culture, is the broad-leaved or London leek, which attains a large growth, the neck acquiring a thick substance, in length from 6 to 9 or 10 inches, dividing upwards into many large, long, thick leaves, arranging themselves in somewhat a fan shape.

"The narrow-leaved leek runs up with a long thin neck, and narrow thin straggling leaves, which, as a degenerate variety, does not deserve culture, and the striped-leaved kind is retained merely for variety, which may be continued by suckers rising from the old roots.

"*Propagation, Culture, &c.*—The common leek is raised annually from seed sown in the spring; the proper time, for the general crop for autumn and winter use, is the same as that recommended for the onion, as from the twentieth of February to the end of March; but for later crops to stand for spring use, any time in April may answer, or for a small crop to stand as late in the following spring as possible, without running to seed, the beginning of May.

"It is a common practice, from the notion of making the most of the ground, to sow leeks along with the crops of onions; which should not by any means be recommended, as experience has shewn it to be considerably the best culture to keep them separate. It is often practised by the market gardeners, when intending to cull out the onions from time to time for market; so that by a daily thinning, they are mostly cleared off by the end of July; and those being gone, the same ground remains occupied by a crop of leeks. This method cannot be practised to equal advantage in the main crops of onions that are to stand to grow to full size for keeping. The best culture, therefore, for the general crops of leeks, is to sow them pretty thick in a spot by themselves, to be afterwards transplanted, either wholly or the greater part thinned out regularly and planted; the others being left at good distances for full growth; and the same situation, soil, and method of sowing are to be adopted as directed for the onion. In June, July, and August, the plants will be of a proper size for transplanting; in doing which, make choice of an open spot of the best ground; if dunged it will be of much advantage, digging in the dung one spade deep; then drawing a parcel of the largest leeks, and trimming their tops and the extreme parts of their root-fibres, proceed to plant them by line and dibber in rows, which for the early crop should be twelve inches distant, and eight or nine inches apart in each row; and for better crops nine inches between the rows, and fix the other way, putting them three or four inches in the ground, or nearly to the length of their necks, and watering them immediately. The only culture they require afterwards is to be kept clear from weeds, which may be done either by hand-weeding, or more expeditiously by applying a sharp hoe in a dry season.

"The leeks thus cultivated are generally finer than those that remain where sown; their necks, which is the principal esculent part, are much longer, and all the part within the earth is finely whitened and rendered mild and tender, which is a desirable property in this plant. However, when it is intended to raise a crop of leeks in good perfection, to remain where sown till their full growth, the seed should be sown much thinner; and when the plants are somewhat advanced, as in June or July, they should be regularly thinned to about ten or twelve inches distance; those thinned out being planted in another compartment of the garden. The remaining plants will by this means attain a larger and thicker growth below, with large spreading tops of thick fleshy leaves.

"This is a valuable family plant from autumn till spring, for soups, broth, &c., and for boiling—the neck part and top leaves together, to use as greens, in the manner of coleworts, &c. to eat with flesh meat. It is in perfection from September till May, when it shoots up to stalk for seeding.

"In order to save the seed of this plant, a quantity of the finest plants should be transplanted in February into a sheltered sunny bed or under a south wall, paling, hedge, or rather fence. This is mostly necessary, as the seeds ripen late in the autumn, and unless assisted by such situation and shelter, seldom ripen freely in this climate. In this view it would be of particular advantage to plant some in a row close under a south fence, at ten or twelve inches distance; they will then shoot up their stalks considerably in May, and in June attain two or three feet in height, when they should be supported, and continued in an upright growth. In July the flowers protrude from their sheath at the summit of each stalk, and form a large globular head; and in September the seeds begin to ripen. After this is effected, cut the heads with part of the stalk, and tie them in

small bunches, hanging them across lines in a dry airy apartment, two or three months, when the seed will be hardened, and the capsules readily break by threshing or rubbing, and thus discharge it more readily from the cells in which it is lodged.

"ALLIUM LINEARE (linear-leaved garlick). Gmel. Sib. 1. t. 13. *Umbel* globose, *stamens* tricuspidate, twice as long as the flower. This grows naturally in Siberia. It has narrower leaves than the common leek, the stalks are smaller, and do not rise so high; the heads of the flowers are also smaller, and of a purple colour. It is called by Miller, Porrum Ampeloprasum. He cultivated it in 1768.

"ALLIUM SAUVECOLENS (sweet-smelling garlick). Jac. Ic. 2, t. 364. *Umbel* capitate; *stamens* subulate, twice as long as flower. This species is a native of Austria, flowering in June and July: flowers white. It is perennial, and may be increased by offsets. Introduced 1801.

"ALLIUM VICTORIALIS (long-rooted garlick). Bot. Mag. 1222. *Umbel* capitate, *stamens* lanceolate, longer than flower, *leaves* elliptical. Grows on the mountains of Switzerland, Austria, Silesia, and Savoy. The wild plant has the root-leaves half an inch broad; transplanted into a garden, the leaves grow to four inches in breadth, without becoming much longer. The stem is from a foot to eighteen inches in height. The petals are of a dirty white, with a tincture of green, sometimes suffused with red; the whole plant, when bruised, has a very rank scent of garlick. The root, when worn, was considered by the Bohemian miners as an amulet, and as a safeguard against the attacks of certain impure spirits, to which they deemed themselves exposed; among them it was surnamed *siegwurz* (root of victory), hence *victorialis*. By the shepherds of other districts it has been used internally as a preservative against the effects of fogs and noxious exhalations—a purpose to which every species of garlick is more or less adapted. Cultivated in 1739, by Mr. Miller.

"ALLIUM SUBHIRSUTUM (hairy garlic). Bot. Mag. 774. *Umbel* fastigiate, *stamens* subulate, *leaves* linear ciliated. This species has been found throughout the south of Europe; also in Barbary, and at the Cape of Good Hope. The bulbs are small; they produce their flowers in May; these are of a pure and dazzling white, and may be considered the most beautiful of this numerous family. It is easily preserved in a pot, with a slight shelter, or in mild winters remains very well out of doors. The soil should be sandy loam. It increases rapidly by offsets. Introduced 1596.

"ALLIUM OBLIQUUM (oblique-leaved garlick). Bot. Mag. 1408. *Stamens* filiform, thrice as long as the flower, *leaves* oblique. Grows from one to three feet in height, with a cylindrical stalk; bulb scarcely of greater circumference than the stem, with its sheathing leaves, of which it appears a mere continuation. The leaves are channelled, and have round sheaths. The flowers grow in a globose umbel, of a greenish yellow colour, rather small. The spathe also is globose, purple, and acuminate. The petals are ovate, erect, concave, yellow, with a green keel; the filaments whitish, with yellow anthers; the germ sub-globose. The whole plant, when bruised, emits a very rank smell of garlick. Blooms in May: hardy. Native of Siberia. Cultivated before 1768, by Mr. Miller.

"ALLIUM MAGICUM (Homer's garlick). Bot. Mag. 1148. *Cauline leaves* lanceolate; *umbel* dense, depressed; *stamens* subulate, shorter than flower. This has a weak, cylindric scape, from one to four feet high, the root-leaves broad, channelled, and obtuse. Corolla white, sometimes with a purple and green, at others with only a green tint on the outside. Flowers in June and July. It is quite hardy. Cultivated in 1596 by Gerard, and preserved by many persons in the gardens, for the sake of variety; but it has a very strong scent. Native of the south of France, Italy, Syria, the coast of Barbary, Spain, and Portugal; Jacquin doubts if it is really indigenous of Austria. Easily propagated both by seeds and offsets.

"ALLIUM ROSEUM (rose-coloured garlick). Bot. Mag. 978. *Umbels* fastigiate; *sepals* emarginate; *stamens* very short, simple. Leaves linear, scarcely so long as the scape, which is cylindric. Spathe obtuse. Flowers larger than in any of the rest, and dark purple. Stamens white and very short. It grows naturally about Montpellier and in Piedmont, in the fields, olive-grounds, and vineyards. Cultivated in 1752, by Mr. Miller.

"ALLIUM DEFLEXUM (deflexed garlick). *Stamina* three-pointed, as long as flower; *leaves* very narrow; *scape* declinate. A pretty species, with pale purple flowers. It is about six inches in height; flowers in June and July. Perennial; may be increased by offsets planted in common garden mould. Introduced 1820.

"ALLIUM STRICTUM (upright garlick). Very upright; *leaves* channelled. Perennial, flowering in July. The plant is about one foot in height; flowers of a pink colour. It is increased by offsets planted in common garden mould. Introduced 1821.

"ALLIUM NEAPOLITANUM (Neapolitan garlick). *Umbel* loose, few-flowered; *leaves* smooth. The bulb is roundish, small, and slightly streaked. Leaves one or two, scarcely sheathing the base of the scape, and even plaited, commonly higher than the scape, bright green. Scape from a foot to two feet high; the end of it constantly nods before the flowers expand. Umbel thin, equal, consisting of from twelve to twenty flowers, frequently nodding. Spathe single, subovate, corollas white, spreading; staminas shorter than the corolla.

"It is cultivated in the gardens near Naples, and flowers in March. Introduced 1823.

"ALLIUM CILIATUM (ciliated garlick). Very like allium subhirsutum, differing only in the smallness of the flowers; *sepals* three lines long. It is perennial, a native of Naples, with white flowers. The plant generally is about nine inches high, may be increased by offsets. Introduced 1820.

"Umbel not bulbiferous; leaves not flat.

"ALLIUM ASCALONICUM (shallot). M. His. s. 4, t. 14, f. 3. *Leaves* subulate; *umbel* globose; *stamens* three-pointed. This relative of the onion was formerly called, and more properly named, Scalion, from Ascalon, a town in Syria, near the Mediterranean, from whence the Greeks first procured it. Pliny says the Ascalonian onions are proper for sauce.

"Dr. Hasselquist found the shallot wild in Palestine. The root of this species of *allium* is conglobate, consisting of many oblong roots, bound together by their membranes; it is very pungent, has a strong but not unpleasant smell, and is therefore generally preferred to the onion for making high-flavoured soups and gravies. It is also much used in pickles, particularly in the East Indies.

"The shallot is considered by the epicures in beef-steaks, as the best seasoning for this English dish, and those who are too refined in palate to swallow the biting root, have their plates rubbed with this relishing plant.

"It was first brought to England in the year 1548, and we may safely conjecture that it soon found its way to the breakfast table of queen Elizabeth.

"The shallot is easily propagated from the small roots or offsets, that afford us another peculiar instance of the mode which nature has adopted in fulfilling her laws for the renewal of the species. The viviparous plants deserve more attention than has been generally given to them. The manner in which they produce their progeny, proclaims the wisdom of their Maker, in a degree not less wonderful to the curious, than mysterious to the uninformed. Nor is the manner in which bulbs are multiplied less beautifully diversified than that by which oviparous plants are produced.

"The shallot, being a native of a warmer country than England, requires more attention than our indigenous plants, for, if it is suffered to remain too long in the cold earth, it decays altogether. In the propagation of this plant, the smaller roots or offsets are the best; these may be planted out in autumn or early in spring: the end of October or beginning of November for the autumn planting, and February and March for that of the spring; but not later than the beginning of April. The spring is the usual

season for planting them, but when planted in autumn, in a light dry soil, they often grow larger, and sooner attain their full growth in the following summer. They must be planted in beds four feet wide, in lengthwise or longitudinal rows; the beds six inches asunder. Each offset to be inserted singly, either by a dibble, or placed in drills of the depth of two or three inches, and the distance of each offset to be six inches.

"They shoot up in leaves in March or April, and the roots increase in growth until July or August. Occasional hand-weeding or hoeing is all the culture required. Towards the end of July or beginning of August, the bulbs will have attained their full growth, which will be seen by the withering of the leaves, which tells us that the occult treasures are matured.

"Then in a dry day take them up, and spread them in the sun to harden; the largest to be cleaned and preserved for use, and the smaller offsets reserved for propagation.

"Shallots are sometimes required for use early in the summer: in such cases a few may occasionally be taken up for an immediate supply.

"ALLIUM CEPA (common onion). *Scape* ventricose beneath, longer than the round leaves. In Latin it was named *cepa* and *cepe*, from *caput*, as is supposed from the largeness of the head. It was also called *unio*, being a single root without offsets, which most other bulbs have; and from this word the English name appears to have been derived.

"The common onion *cepa*, owes its chief qualities to cultivation. Pliny, who mentions all the countries from whence the Greeks as well as the Romans procured different varieties of this root, says he could not discover that they ever grew wild.

"There is no plant that has been so subject to the caprice of fashion, and the disputes of physicians, as the onion. It has been the common seasoning for meats, with most nations, from the earliest time to the present, from the table of the king to that of the peasant.

"It was one of the Egyptian divinities, who used to swear by the onion, solemnly calling it to witness their oath as a god.

"Among the complaints which the Israelites made to Moses, when in the wilderness, was that of deing deprived of leeks, onions, and garlick, of which, said the murmurers, 'we remember we did eat in Egypt freely.'

"A friend, who has travelled in that country, says, we should not condemn these sons of Abraham, if we knew how much superior and sweeter the onions of Egypt are when compared with those of Europe.

"Theophrastus, who died in his 107th year, complaining of the shortness of life, wrote on the onion about 200 years before the birth of Christ; and Palladius, a Greek physician, who also wrote on this acrid root, recommends it to be sown with savory. Pliny follows the same opinion, and says, 'onions prosper when savory is sown with them.' It appears to have been a study with the ancients to find what plants thrived well together, or according to their belief, what herbs had a sympathy with, or antipathy to each other.

"We find that all the plants which they recommend to be sown or planted together, are of very opposite natures, and there may be more reason in the system pursued by the ancients than is generally allowed; for plants drawing the same juice from the earth must naturally weaken each other; whereas those requiring different nutriment may in some degree assist each other, each feeding on juice that are prejudicial to plants of the other species. Our husbandmen acknowledge the principle by changing their crops. Lord Bacon carried this opinion so far as to say 'the rose will be sweeter if planted in a bed of onions.'

"Gerard says, 'the onion being eaten, yea, though it be boiled, causeth head-ache, hurteth the eies, and maketh the man dim sighted; dulleth the sences engendereth windiness, and provoketh over much sleepe, especially being eaten rawe.' He adds, 'being rawe, they nourish not at all, and but a little though they be boiled.'

"Dean swift says—

"'This is every cook's opinion,
No savoury dish without an onion;
But lest your kissing should be spoil'd
Your onions must be thoroughly boil'd.'

"Their property of drawing tears has been noticed by our immortal bard.

"'If the boy have not a woman's gift
To rain a shower of commanded tears,
An onion will do well.'

"We learn from Bradley, who wrote in 1718, how much this vegetable was then esteemed. After having stated that the potato was thought a root of little note, he says, 'I now come to treat of the onion, a root more generally used in the kitchen than any other. Of this there are two kinds worth the gardener's care; the first is the Spanish onion, which affords a large sweet-tasted root, and the other the Strasburg onion, which is more biting, and lasts good much longer than the former.'

"The many domestic purposes to which this strong-scented vegetable is applied at the present time are known to every one: its nature is to attenuate thick viscid juices, consequently a plentiful use of it in cold phlegmatic constitutions must prove beneficial. Many people shun onions, on account of the strong disagreeable smell they communicate to the breath: this may be remedied by eating walnuts, or a few raw parsley-leaves immediately after, which will effectually overcome the scent, and cause them to sit easier on the stomach.

"METHOD OF PROPAGATION AND CULTURE IN THE ONION KIND.—*Common Onion.*—Among the several varieties of the common onion, the Strasburg is the best for general culture, having a handsome bulb, mostly assuming a roundish oval shape. It is of firm growth, and generally keeps well for winter use. The Spanish onions are large and flat; the first sort is, however, of the mildest flavour; but all the varieties for the most part afford profitable crops, and none excel them for culinary purposes; but they seldom keep so well after Christmas as the Strasburg or oval sort of onion. The Portugal onion is a very large handsome bulb, of a roundish-oval shape, though it rarely attains the size here, as in that climate, as is obvious from those annually imported from that kingdom. If, however, seeds saved in Portugal be sown here, the bulbs will arrive at a much larger size than from such as are saved in this country, especially where preserved two or three years successively, in which cases they are so far degenerated, that the bulbs become flat, and not larger than the common onions. The mode of transplanting them at an early period, which is adopted in that country, may also have much effect in rendering the bulbs so large. From this sort of onion being very mild, it is much esteemed for sauces and other culinary uses.

"All these kinds are propagated by seed sown annually; which for the general crop should always be performed from about the twentieth of February until the latter end of March, though in cold wet stiff soils it may be proper to defer sowing entirely until towards the middle of the latter of these months. But in cases of omission in sowing at the times above recommended, it may be performed with tolerable success in the beginning or any time before the fifteenth of April; but the crops of the February or March sowing always bulb more freely and acquire a much larger growth than those sown at later periods.

"The most proper situation for crops of this kind is an open exposure, and where the soil is moderately light and rich in vegetable matter. Thus spots of the best mellow ground in the garden should always be chosen, with the addition, if possible, of a good coat of well rotten dung, dug well in, but not too deep, the surface being kept level, and while it is fresh stirred, well raked, and the seed sown—a point which is of importance to be attended to. The sowing, when the surface is

so wet or moist as to clog to the feet or rake in preparing it, should not, however, be performed.

"The proper quantity of seed is in general about an ounce to every rod or pole of ground; but where it is not required to have them thick for cuttings, two ounces for three rods may be sufficient. Great care should be taken to procure fresh seed, as but very little of that which is kept more than one year will vegetate.

"The seed may either be sown over the whole of the piece or plot of ground, or it may first be divided into beds of four or five feet in width, allowing foot-wide alleys between them. In sowing, the seed should be put in with a regular spreading cast, and the surface, when very light, immediately trodden over evenly upon the seed; afterwards, where sown in beds, the alleys may be pared an inch or two deep and the earth cast over them, proceeding directly to rake in the seed regularly with an even hand, trimming off all the stones, roots, &c.

"The method of sowing them in beds is the most eligible, where it is designed to draw or cull the young onions from time to time for market or family use; as, in such cases, a person can stand in the alleys without treading upon the beds, which not only renders the surface hard, so as to injure the crop, but highly destructive, by trampling upon the plants themselves. It is likewise very convenient to stand in the alleys, in order to weed, thin, or hoe the crop as occasion may require. Although it is a common practice in the general culture of onions to sow them thick, in order to allow for culling or drawing out the superabundant plants, by degrees as they are wanted, it would no doubt be a better mode to sow a piece particularly for general culling, exclusive of the main crop; because, by daily thinning out the superfluous plants, there is no avoiding treading upon, disturbing, and loosening the remaining ones, by which they become stinted in their growth, and by no means so fine. There is also another very common but injudicious practice, which is that of mixing other crops, such as leek, lettuce, radish, carrot, &c. with these crops. It is productive of confusion, as well as an obstruction to the chief crop, without producing any great advantage; nothing should therefore be admitted, except a very thin sprinkling of coss lettuce in some cases. In about fifteen or twenty days after the seed is sown the plants generally appear, and in a month or six weeks after that, as in May and the beginning of June, they will be three or four inches high; when they should be well cleaned from weeds, and the main crop thinned to three or four inches distance. The weeding and thinning should be begun in due time, before the weeds branch and spread much, which may either be performed by the hand or small hoe; the latter is the most expeditious method, as by it one man may do as much as three, and it is also the most beneficial to the plants; as by stirring the ground about them with the hoe, it greatly forwards their growth, as is mostly seen in a few days after the operation. This mode, however, is more particularly eligible for the larger principal crops, for which a good sharp one-hand hoe, about two inches, or not more than two and a half broad, is the best, taking the opportunity of dry weather for performing the business, and carefully cutting up all weeds. Where the onions stand too close, they should be cut out in a regular thinning order to about three inches distance; or in such crops as are not wanted for occasional cutting, they may be hoed out at once to about four or five inches, having regard to leave the strongest plants, as much as possible, for the continuing crops.

"In the course of two or three weeks or something more, it will generally be proper to run over them again in the same manner, in order to cut up all advancing weeds, and any superabundant plants that may have escaped in the first hoeing; after this they seldom require any further culture, than that of pulling out such casual straggling weeds as may rise.

But where the crops are small, or where they are required for thinning or culling by degrees, for use in their young green state and in small bulbs, the weeding and requisite thinning, where they are in clusters, may generally be best performed by the hand. In the advanced growth of the crop, when the superabundant plants are occasionally thinned out for use, as wanted, they should be drawn somewhat regular, so as to leave a sufficiency of the strongest plants remaining at moderate distances, for a full crop to attain their full growth in large bulbs.

"It is highly necessary to continue to keep the different crops very clear from hurtful weeds in their advancing growth during the months of May, June, and July, which being their principal growing seasons, if they are not kept free from weeds, and sufficiently thinned to proper distances in due time, they draw one another up, weak and slender, which much retards their bulbing. About the middle or latter end of June the continuing crops begin swelling a little at bottom in their bulbing order, but more fully in July; and in August the bulbs arrive to full growth, and are proper for taking wholly up. Towards the middle of August the crops in general should therefore be examined, and when the necks shrink and fall, and the leaves wither, it may be concluded that the bulbs are arrived at maturity, and have done growing.

"They should then be pulled up, cleaned, dried, and housed for use; this being best done in dry weather on a piece of the ground hoed, raked, and cleaned, in order to spread them on as they are pulled up, to dry and harden. They should lie in this way a week or a fortnight, being turned every day or two, when, if the weather proves dry, they will be duly prepared for keeping; the first opportunity should then be taken to house them. The bulbs must be first divested of all adhering earth, loose skins, and the grossest parts of the leaves and neck, rejecting all infectious and bruised ones, and then they may be carried into any dry upper room, out of the damp, spreading them on the floor as thinly as convenient. The closer the room is kept the better, but care must be taken to turn them over once in three weeks, and to clear out such as have any tendency to infection.

"As in the culture of onions it frequently happens, that through badness of seed many are disappointed of a crop, by waiting in expectation of the plants rising till it has been too late to sow again: in such cases recourse may be had to transplantation from other gardens, as a neighbouring one, where there are superfluous crops, or a bed or such part of one as is necessary may be purchased from a market gardener. This business should be done in May or early in June, and if possible in moist weather; having a spot of well-dunged ground prepared, take up the plants with good roots, and plant them in rows six inches distant, and four inches asunder in each row, inserting the roots but moderately into the ground, for if planted too deep, they do not bulb well; giving them a good watering as soon as transplanted. By repeating the waterings occasionally for a week or fortnight, the plants will generally grow freely, and form tolerably handsome bulbs.

"Onions for pickling are in great request in many places; such as are proper for this purpose should not be bigger than common round buttons, therefore, in order to procure them in due quantity, some seed should be sown late, in a spot of light poor land; about the middle of April is probably the best time. It should be sown moderately thick, the plants requiring little thinning, except where they rise in very thick clusters. They bulb in June and July, and are generally fit to take up in August. In the spring many of the keeping onions will unavoidably grow as they lie in the house; these may be planted out in rows, at six inches distance, and will serve to draw by way of escallions.

"*The Autumn or Michaelmas crop* is generally sown in August, and the plants rise before Michaelmas, stand the winter, some to be drawn occasionally for use in that season, but principally intended for spring use, to be drawn up for young salads, &c.; and likewise where the Strasburg or any other variety of the common onion are sown, they, if permitted to stand, bulb to a tolerable size in June, and supply the kitchen or market as headed onions, till those of the spring crop are bulbed.

"But as the common onion is liable to be cut off in severe winters, it is always necessary to sow at the same time some beds of Welsh onions, which bid defiance to the most rigorous winter frosts. August is the best season for sowing these crops, for if sown sooner they are not only apt to get too forward in growth before winter, but to run up for seed earlier in the spring; and therefore the proper time to sow the main crop is the first or second week of that month, or in the third week for a late standing one, sowing them in beds four feet wide, with twelve inch alleys between; sow and rake in the seed as directed in the spring crop, only let a much larger quantity be sown in this case. The plants generally appear in a fortnight, and numerous weeds, to which early attention must be had to clear them out by hand before they begin to spread; but the plants of this crop are not now to be thinned. But in November and December, if they stand very thick, some of the largest may be occasionally thinned out for various uses.

"*Saving Seed.*—February is the proper time to plant onions with this view, though this is often done in October by those that save great quantities for sale. For this purpose, make choice of a due quantity of the largest and handsomest bulbs, rejecting all blemished ones, and such as have already made any effort to grow, and having made choice of a spot of ground well exposed to the sun, which being dug, proceed to plant the onions: strain a line, and with a hoe or spade open three drills, twelve inches asunder, and six deep; place the bulbs therein nine inches distant, and rake the earth over them; measure off two feet for an alley, and plant three more rows as above, and in that manner proceed to the end; the wide space of two feet is by way of alley to go between to hoe and clear off weeds as well as to stake and support the stalks of the plants when necessary. In June the flower-stalks will be shot to their full height, and the flower heads will be formed at top; to secure which, in erect position, drive some stout stakes in the ground along each row, at two yards distance, and from stake to stake fasten double lines of pack-thread; and if these are tied together in the interval, between the stems of the plants, it will effectually secure them. About the latter end of August the seed will be ripe, which is known by the capsules opening, and the black colour of the seed; the heads should be cut in a dry day, and spread upon cloths in the sun, care being taken to remove them under cover in case of wet and at night; and when perfectly dry, beat or rub out the seed; cleaning it from the rubbish, and putting it up in bags for use.

"As it is of the utmost importance to have good fresh seed, some to try its goodness, before they venture their general crop, sow a little in a pot, and place it in a moderate hot-bed or near a fire; a more expeditious method, however, is to tie about a thimble full of the seed loosely in a piece of linen rag, and put it into a vessel of hot water, suspended by a thread; in ten to fifteen or twenty minutes pull it out, and if the seeds are good, they will in that time have germinated or sprouted, perhaps to the extent of a quarter of an inch in length.

"*Method of preserving onions from the grub.*—Mr. E. Hildyard, gardener to Sir Thomas Frankland, at Thirskleby, in Yorkshire, has stated, in a communication to the Horticultural Society, that having continually lost his crop of onions, in consequence of their being attacked by the grub when half grown, he had tried the effect of trenching his beds, and this had destroyed or removed his enemy. The soil of the garden being very strong, he trenched it in winter, digging in manure at the same time, and left it exposed to the frost in a rough state till the time of sowing. It was then raked without digging, and the onion seed was sown in drills at eight inches apart. He thins the plants and stirs the ground three or four inches deep, twice during their growth. The crops obtained by this practice are not only uninjured, but of superior size, and never fail. Mr. H. finds the plan answers equally well for garlick and shallots; the latter he always plants in preference in November; they then grow larger and are more productive.

"He sows his onions in the middle of February, if the ground be in a fit state to work properly, for the earliest sown onions are always the largest.

"*Charcoal Dust* is recommended in a communication to the Horticultural Society, as a top-dressing for onions, and as a cure for the clubbing in cabbages.

The charcoal-dust should be the refuse of a charcoal-pit. It must be spread upon the ground about half an inch thick, before the sowing of the seed, and merely skuffled in with the point of a spade, so as to mix the top soil and charcoal-dust together. Six years' experience have proved that it is a remedy for the grub and mouldiness in onions; and it has been repeatedly known to prevent clubbing in the roots of cabbages and cauliflowers.

"In a communication to the Caledonian Horticultural Society, Mr. Wallace, gardener, Ballechin, observes:—'The soil of the garden at Ballechin was light, and the ground destined for onions was always dug twice a year, viz. in autumn and spring; giving a good coating of dung in September, and a light one in March, immediately before sowing. The crop of onions was poor, and much infested with maggot, and got worse and worse every year. To try the effect of a change of system, the ground was only hoed and raked in autumn, and dug half-spade deep, applying well rotted cow-dung in spring before sowing the seed. The crop was excellent, and entirely free from the maggot.'

"*The reason assigned for this favourable result deserves attention, as a principle in the management of light soils.*

"'I find light and dry soils are rather hurt than benefitted by too much labour and pulverising the ground; and I was led at first to adopt this method, from observing that such of the tenants in my neighbourhood as gave repeated ploughings to their bare lands had seldom but a very poor crop after it.'

"Mr. J. Smith, gardener to James Hammond, Esq. at Potter's Bar, near Barnet, in a communication to the Horticultural Society, gives 'directions for forcing onions to produce bulbs in clusters at an early season. He sows the seed in April, thickly in a bed, and does not afterwards thin the plants which come up; this causes them to remain small; a part of them are used for pickling, and the remainder, being about the size of walnuts, are planted in January or February, pressing each onion into the earth so deep as just to cover it. As soon as the seed-stalks appear, he breaks them off, and instead of making any effort to form new ones, the onions begin to form young bulbs round the old ones. By this process onions may be obtained, two or three inches in circumference, fit for the kitchen early in spring, at a time when spring-sown onions are not larger than quills. Onions thus thrown into clusters will be full-grown by the end of June, and fit to take up then, but they do not keep well.'

"*Onions are preserved from the maggot and rot* by watering the beds with lime water to that degree that the lime may lay one-eighth part of an inch upon the beds.

"*Weight of onions.*—December 5, 1827, was exhibited at the Horticultural Society, four round Tripoli onions, grown by Mr. Barker, of Edmonton, that weighed $7\frac{1}{2}$ lbs.

"One grown in the garden of Mr. Morgan of Oswestry, was drawn last week (October 1, 1831), measuring upwards of 19 inches in circumference, and weighing 3 lbs. 1 oz.

"An onion weighing 1 lb. 5 oz. and measuring $16\frac{1}{4}$ inches in circumference, was lately (October 5, 1831) pulled by Mr. W. Ramsay, at Chancelot, near Edinburgh.

"*To prevent the sprouting or germinating of store onions during the winter and spring.*—Apply a heated iron for a few seconds to the nozle of the onion, whence the roots protrude. This is found by experience to be an efficient mode of preserving them.

"QUALITIES.—*The sensible, as well as chemical qualities* of the onion, resemble those of garlick; but are much weaker. On distillation it yields a small portion of acrid volatile essential oil, combined with sulphur; and the recent juice contains sugar, mucus, phosphoric acid, phosphate of lime, and citrate of lime."

An interesting branch of the subject of botany has been

lately taken up by Baron Humboldt, who has traced the geographical distribution of plants in an extensive and scientific manner; and has in his researches discovered the singular fact, that in a climate of a particular temperature, the plants are nearly of the same class. This has been explained on the principle that similar causes produce similar effects. The same circumstances take place in the distribution of animals. Thus, a lake on a mountain in Scotland shall have the same sort of fish in it as one in parallel circumstances in Switzerland, &c. The char is found in lakes a thousand leagues asunder: Captain Parry even found a species of char in a lake in Melville Island, near the pole. Mr. Saunders, who travelled in Thibet, found on the mountains there, the same plants as would be produced in the same situation in Europe, the arbutus uva ursi, for example, which is a native of Scotland, Switzerland, and Canada. Now these countries stand so widely separated, that it is scarcely within the compass of probability, that seeds could be wafted from the one to the other.

In medicine, the revolution lately produced is very great; for almost all the numerous tribes of inefficient herbs and simples have been set aside, and only those plants retained, which operate powerfully on the human system. Every reader knows the chief of these powerful vegetable drugs, among which we may mention opium, ipecacuanha, jalap, rhubarb, hemlock, foxglove, henbane, belladonna, meadow-saffron, cherry-laurel, and a few others. Many of these are very strongly poisonous, when injudiciously managed; and when they are administered with evil intent, they cannot be so easily detected as the metallic poisons. This is still a desideratum in medical chemistry, which we hope to see soon supplied.

Perhaps it is scarcely necessary for us to mention the old popular prejudice, that herbs and simples are both safer and more efficacious remedies than drugs; and we would not have alluded to it, were we not suspicious that it still lurks in the minds of many of the better informed classes, and this merely for the want of thought, merely from taking the opinion from hearsay, as (by the way) we take most of our opinions; for observation without help is much rarer among us than we are willing to allow. In the present case of the herbs, nothing could be more strikingly erroneous and false, than that they are safe remedies which any body may use with impunity. We have just seen, that some of the strongest poisons which we posssess are derived from herbs. A single drop of the acid which may be extracted from cherry-laurel water, when applied to the nose of a dog, made him instantly drop down dead; and the same effect would be produced in a man, were it applied to a part destitute of skin. This dreadful poison has the great disadvantage of fine flavour like that of peach blossoms, or bitter almonds, and has in consequence been lately much used in making up wines, to which it gives a rich musty flavour. Wine of this character, if taken in quantity, must be very pernicious, and is often the unsuspected cause of many sudden deaths in people of good health. We think it quite unnecessary to combat the prejudice of the safety of herbs by farther illustration.

We should now try, before we leave this subject, to become a little more erudite in the science of botany, otherwise, we may gain for ourselves a confirmed character for superficialness and skimming, from those who think that profound learning consists in grave books and mysterious language. Such did very well when magic was in fashion, but most men, though not all, are now too wise to be duped—to believe that what is unintelligible must be profound, and what is decked in long and sounding words, must be the deepest learning. So let them think; we shall not disturb their opinion, for if they give us the plain and useful facts, and the plain and interesting arguments, we cheerfully allow *them* to retain all the solemn mystery and stately importance of what is certainly mock science.

In the solution of many useful and interesting questions connected with the science of botany, which can only be determined by minute and accurate information, the Gardener's Dictionary cannot fail to be an excellent guide; for the accuracy of the descriptive details will enable the student to identify every plant he meets with, from the forest tree to the tiniest moss; and without such minute knowledge, it is impossible to proceed far in philosophical experiment and discovery.

There is one feature in this work, to which we would call particular attention. It is the extent to which condensed description is carried, which appears to us little short of miraculous, as the reader will the more readily comprehend from the fact, that it would require several hundred pounds' worth of books to furnish all the information given here for less than one. The engravings alone, indeed, must have cost, we should imagine, five or six hundred pounds, and the other expenses probably amount to a similar sum. Altogether, we never saw so extraordinary a book; as every body, from the most illiterate gardener to the most erudite botanist, must be astonished at the multitudinous mass of information it contains.

## BANFFSHIRE.

This county, forming part of the north of Scotland, is bounded by the Moray Frith on the North, by Aberdeenshire on the south and south-east, and by the county of Moray on the west. It contains 647 square miles, or, exclusive of a small space covered with water, 412,800 English acres. Its population in 1811, was 36,668; in 1821 it was 43,561, and in 1831, it was 48,604. The greater part of this maritime county was formerly included in the province of Moray, the bounds of which are supposed to have been nearly the same with those of the ancient territory of the *Vacomagi*. The south-west angle of the county is comprehended in the range of mountains distinguished by the name of the Highlands; and throughout this subdivision the Gaelic language is generally understood, though the English is also in common use. This bleak district is named Strathaven, and the inhabitants are said to be still considerably enslaved by the superstitious notions of ancient times. The other districts present a variegated surface to the eye, and contain a large proportion of very fertile land. Throughout there are many beautiful straths and glens, containing an immense variety of picturesque scenery. But the climate, though healthy in general, is cold and wet.

The soil on the flat grounds is for the most part light and sandy; on the hills a deep clay is more prevalent. Along the coast for about thirty miles it is well cultivated. There is also everywhere much valuable grazing land, well sheltered by natural wood, particularly on the banks of its streams, and in its romantic glens. The Spey, one of the most considerable rivers in Scotland, flows along its western, and the Deveron along its eastern boundary; and both yield a considerable revenue from their salmon fishings; the former to the amount of £8000, and the latter to about £2000 yearly. A prodigious quantity of limestone is produced in the county, but from the want of coal, it has never been extensively used. In the inland parts peat is the only fuel which the labouring classes are able to procure. Besides salmon, we should mention that on the coast, haddocks, whitings, flounders, mackarel, turbot, cod, ling, tusk, skate, crabs and lobsters abound; of which, as well as of the salmon, a great portion is sent to supply the London market.

The principal mountains of Banffshire are Belrimes, Knockhill, and Cairngorm, the last of which rises to an elevation of 4050 feet above the level of the sea. Many of the mountains are caped with moss; some there are, planted to the very summit. Several years ago the woods of the whole county were reckoned to amount to 18,000 acres in extent: two thirds of which were said to be planted, and the remainder

natural. On the whole, Banffshire may be described as a hilly, and in some places a mountainous county, (except the tract along the sea shore), interspersed with many fertile valleys, which are well adapted to the cultivation of grass and corn. As to the line of coast, it is bold and precipitous, presenting a few small bays and creeks.

The agriculture of Banffshire is upon the newest and most approved principles. The soil, though varying even in adjacent fields, is in general rich and productive, yielding heavy crops of wheat, barley, oats, and other grain; and the grass and green crops are equally abundant. Though the quantity of land under cultivation has not been distinctly ascertained, it may safely be affirmed that the amount now under the plough is more than double of what it was thirty years ago. The extent of the farms is in general from 150 to 200 arable acres, independently of moorland and pasture grounds. The rent per acre at an average, may be stated to be 22*s.* and the duration of leases at nineteen years; although there are some who possess on life rent, and a few who hold leases for a longer term. The whole of the farms, even the smallest pendicles, may now be said to be under regular rotations of cropping; generally a five or seven years course. The fields are well laid out and subdivided, and properly cleared and manured, for which last purpose large quantities of lime and bone dust are annually imported; but lately some successful experiments have been tried with prepared kelp as a substitute for bone dust, which can be but partially procured, and at a very high price. The ridges are all straight, and the wet grounds have been also drained and cultivated, so as to effect a total revolution in the ancient modes of agriculture within the county. The cattle and stock of every description are of the finest breeds, and are sought after by the dealers at home, as well as conveyed by sea to London, where they bring the highest prices.

We have a proof in the history of this county, of how much permanent good may be effected by the exertions and patronage of one individual, and one that should be an example to the great. One of the Earls of Finlater, as early as the year 1754, not only introduced and exemplified on some of his own farms the most approved practices then known in England, but held out liberal encouragement to his tenants to follow his example. Since that time, improvement has been greatly accelerated by agricultural associations, and the annual premiums held out for the best specimens of live stock, and the best productions of the soil.

The manufacturing industry of this county is considerable. At Banff, which is a royal borough, and the principal town of Banffshire (or Bamffshire as it is sometimes written, being more conformable to the pronunciation), an iron-foundry was established in 1825, which has proved of great utility, particularly to agriculture, in supplying many requisite articles. There is here a weekly market, which is amply supplied with articles of immediate utility. There are a number of extensive distilleries which produce excellent spirits, and the means for feeding droves of cattle. The shipping trade is carried on at the ports of Banff, Macduff, Portsoy, and Gardenstown. The imports consist of timber, coals, iron, and other necessary articles. The exports are grain, meal, black cattle, swine and other live stock, principally for the London markets. A very extensive connection has been formed with various ports on the southern shores of the Baltic, to which vast numbers of cured herrings are sent. In 1815, there were only two boats of fifteen tons each employed in the herring trade, but in 1826 they amounted to 470 of the same tonnage each, and the value of the fish caught was estimated at nearly £100,000 sterling.

Among the obstacles to improvement that may be quoted in regard to Banffshire, entails seem the chief, for these comprehend almost the whole lands within the county, fettering with restrictions and limitations the tenantry in a grevious manner. These limit the duration of leases frequently to a very short period; and astricted multures also prevail in all their ancient feudal vigour, forming an excessive tax on improvement and industry.

In the lower part of the county, towards the coast, there are several elegant mansions, of which the most conspicuous are Duff-house, the principal seat of the family of Fife; Cullen-house, the seat of the Earl of Finlater and Seafield; and Gordon Castle, the most princely mansion in the north of Scotland. These and a number of gentlemen's seats in the interior are surrounded by extensive parks and ornamental plantations, very tastefully laid out.

Many remains of antiquity may be traced in this county, particularly tumuli, upright stones, cairns, Druidical circles, and various ruins of castles. Several bloody conflicts took place here between the Scots and their Danish invaders, in which the latter were uniformly defeated, and many spots are pointed out where these piratical foes were slaughtered to a dreadful amount, particularly at Gamrie, Cullen, and Mortlach. The church of Gamrie, "the Kirk of Skulls," into the walls of which were built the bones of the Danes who fell in the field called Bloody Pots, was used as a place of worship till 1830, a period of above 820 years from the date of erection. We might enumerate other dark eras and deeds in the history of Banffshire; but we rather refer to the town of Banff as it now presents itself to the statesman and the moralist, as an example of the advancement made in the more civilized parts of the country. Banff is generally considered by strangers who visit it now, as a very neat and flourishing town. There is a fine bridge of seven arches over the Doveron. It contains also a handsome church, besides several chapels; a town house with an elegant spire, and a new prison constructed on the principles recommended by Howard. In 1786, an academy was substituted in place of the former public schools, for the different branches of education, which is superintended by a rector, assisted by four other masters, who teach Latin, Greek, French, Geography, Mathematics, and the different elementary branches. A charity school has also been established. There are several private English schools as well as those for female boarders. Nor is there wanting a good collection of books, made by a society of gentlemen, besides a circulating library. The poor are liberally provided from the public funds, and a great number of the lower classes have formed themselves into friendly societies. We may, therefore, safely say, that Banffshire is an honour to the North of Scotland in a variety of respects, and indeed, to the national character.

## GARDENING OPERATIONS FOR AUGUST.

In the beginning of this month the weather is still hot, and usually calm and fair. What remained to be perfected by the powerful influence of the sun, is daily advancing to maturity. The farmer now sees the principal object of his culture and the chief source of his wishes waiting only for the hand of the gatherer. Every fair day is, at this season, of unspeakable value; since when the corn is once ripe, it is liable to continual damage while standing, either from the shedding of the seeds, from the depredations of birds, or from storms. Heavy wind and rain beats the crop to the earth, and, if the weather continues warm, the corn grows, that is, the seeds begin to germinate and put out shoots. Grain in this state is sweet and moist; it soon spoils on keeping; and bread made from it is clammy and unwholesome.

The harvest-scene is beheld only in its perfection in the open-field countries, where the sight can take in at once an uninterrupted extent of land waving with corn, and a multitude of people engaged in the various parts of the labour. It is a prospect equally delightful to the eye and the heart, and which ought to inspire every sentiment of benevolence to our fellow-creatures and gratitude to our Creator. The rural festival of *harvest-home* is an extremely natural one, and has been

observed in almost all ages and countries. That which has been the produce of the year, and the cause of so much anxiety to the husbandman, is now beyond the reach of injury; and to the poor labourer there is the granary, that which is to cheer his prospect during the course of another year.

This month is the season of another kind of harvest in some parts of England, besides that of corn—we mean hop-picking. The hop is a climbing plant, sometimes growing wild in hedges, and cultivated on account of its use in making malt liquors. Hops are planted in regular rows, and poles set for them to run upon. When the poles are covered to the top, nothing can make a more elegant appearance than a hop garden. At the time of gathering, the poles are taken up with the plants clinging to them, and the scaly flowering heads, which is the part used, are carefully picked off. These are a finely flavoured bitter, which they readily impart to hot water, improving the taste of beer, and making it keep better. Kent, Sussex, and Worcestershire, are the counties most celebrated for this production. But we must speak of garden operations, properly so called.

*Kitchen Garden.*

Sow some prickly-seeded or triangular-leaved spinach, for a winter and spring crop; for, though the round-seeded produces larger and more succulent leaves, the other is to be preferred more, because it is by much the hardier of the two. After the plants have got their fruit leaves about an inch broad, they should be thinned to the distance of four inches from one another, and kept free from weeds. Sow some cabbage seed of the early and late kinds, to produce plants for next year. Sow some onions to be used when young, in winter or spring, or to produce a crop of young onions this summer. The Strasburg or any other kind may be chosen; the Welsh sort is particularly hardy, and stands the winter well; for though their tops should be destroyed by the severity of the weather, they will push up again from the root in the spring; this onion, however, does not produce bulbs. Towards the end of the month, sow some cauliflower seed to produce plants for an early crop next summer, which may be protected during the winter, either under hot-bed frames, bell or hand-glasses, or in a well-sheltered border, exposed to the south. Between the 18th and 24th of the month, is perhaps generally the best time to sow these seeds. The London gardeners, who sow great quantities, are accustomed to sow them on a particular day, viz. the 21st. If they be sown too early, they are apt to button, as the gardeners term it, that is, run up to seed without producing heads of a proper size; and if they be sown too late, the plants do not acquire sufficient strength before winter to stand its severity. Some sow lettuce seed about the middle of the month, both to supply the table late in the autumn, or beginning of winter, and to plant out into well-sheltered borders, or under hot-bed frames, to stand during winter.

Plant out broccoli, savoys, bore-cole, and celery, for the use of winter and spring. The cordoons which were planted in June should have some earth laid up to their stems, to blanch them and render them fit for the table. That this may be accomplished the more easily, tie up the leaves of each plant with a piece of bass mat or small straw rope, and apply some earth close round the stem, which earthing must be repeated at intervals till it rise to the height of two feet. The principal crops of onions will be fit for taking up in the course of this month. Choose a dry day for this process; take off the stalks within two or three inches of the bulb; spread them in some dry place, exposed to the sunshine, for ten or twelve days, that they may be thoroughly dried.

*Fruit Garden.*

Look over vines, figs, and other wall-trees; remove all fore right and superfluous branches, and nail the others close into the wall, that the rays of the sun may have free access to the fruit. Vines in the vine-yard, likewise, should be fixed to the stakes, and cleared of all superfluous shoots.

*Flower Garden and Pleasure Ground.*

About the end of the month, you may propagate, by slips, fibrous-rooted perennial plants, such as double rose campion, catch-fly, double scarlet lychnis, double rocket, double ragged robin, bachelor's button, gentia nella, polyanthuses, auriculas, double daisies, &c. As these plants frequently grow in tufts, they may be taken up and divided, taking care that every slip be provided with some roots. Auricula plants in pots should receive fresh earth. Auricula and polyanthus seed may be sown any time this month, but will not come up till spring. Layers of carnations, double sweet Williams, and pinks, that are properly rooted, may be separated from the parent plant, and planted into borders or pots. Cuttings and pipings of pinks and carnations may be planted out into beds or borders. Towards the end of the month, the seeds of bulbous-rooted flowers, such as tulips, hyacinths, narcissus, iris, crocus, fritillaria, crown imperial, lilies, and snow-drops; likewise the seeds of anemone, ranunculus, and cyclamen, may be sown in beds or boxes, to obtain new varieties. They must be protected during winter from the frost; and when they appear above ground in spring, they must be kept clear of weeds. Plant out seedling biennials and perennials. About the close of the month hedges should receive their second clipping.

*Nursery.*

Budding may still be performed about the beginning of the month, and those trees which were budded three weeks or a month before, should be examined. If the buds remain plump and fresh, there is reason to believe that they have succeeded; in that case, the bandages must be loosened.

*Green-house and Hot-house.*

Green-house plants, in the open air, must be managed as already directed. The plants in the hot-house must receive a plentiful allowance of air and water. Succession pine-apple plants, that are to produce fruit next year, should be shifted into larger pots, viz. twenty-fours or sixteens, about the beginning of the month. When the plants are turned out of the old pots, and placed in the new ones, a quantity of light rich soil should be previously put into the bottom of each pot; then they should be filled up around the plants with the same, watered, and plunged into the tan, which at the same time should be turned over and receive an addition of about one-third of fresh tan.

We shall conclude with a few general observations of a common-place order. Every one knows that the number of plants in flower is now very sensibly diminishing. Those of the former months are running fast to seed, and few new ones follow. The uncultivated heaths and commons are, however, in their chief beauty, from the flowers of the different kinds of heath or ling with which they are covered, so as to spread a rich purple hue over the whole ground. Many of the fern tribe also shew the rusty-coloured dots on the backs of the leaves, which are their parts of fructification.

## SCOTCH GARDENERS.

Scotland has long been remarkable for producing professional gardeners in greater numbers than any other country of Europe, of equal extent. Several of them have also been eminent, and have attained to the highest rank in their profession, not only in England, but in foreign parts. At the present day, very many of the nobility and principal gentry in England, have Scotch head gardeners; while the numbers of an inferior class to be found in every county south of the Tweed may well surprise any one, and induce us to inquire what are the causes for this state of things. It is not easy of course, to assign very

precisely what these have been, in their separate workings. Nameless or overlooked circumstances have often an amazing influence, as may be seen from the manner in which trifles, when aptly joining, work upon each other. We shall, however, by adopting the account to be found in the General Report of the Agricultural State, and Political Circumstances of Scotland, drawn up under the directions of Sir John Sinclair, arrive at some very satisfactory reasons for the pre-eminence alluded to.

Scotland, while a separate independent state, and jealous of England, was careful to maintain political connexions with the more polished kingdoms of Europe, particularly France. The Scotch nobility, who were thus frequently led abroad, must have early become acquainted with the improved state of horticulture in some parts of the continent: and this when contrasted with the barrenness and bleakness of their native seats, must naturally have made a deep impression on their minds, and produced, more or less, a desire to make horticultural improvements, and cultivate the choicer fruits at home. Some of the oldest gardens and orchards still contain the remains of fruit-trees, which were originally brought from France and the Low Countries, long before gardening was generally practised in Scotland.

In those times, too, the clergy throughout the whole of Europe and the East, had such an intercourse among themselves, as necessarily led them to become acquainted with the best productions of different countries; and it seems natural to suppose, that the ecclesiastics of Scotland would very early seek relief from the *tædium* of their monastic life, by endeavouring to cultivate the different fruits which the climate would produce. Chalmers, in his Caledonia, after remarking that the abbots were among the earliest Scotch horticulturists, and that their orchards are still apparent to the eyes of antiquarians, while their gardens can now be traced only in the chartularies, gives a number of examples of gardens and orchards, being mentioned in writings of the 12th and 13th centuries. Even at this day, several excellent kinds of fruit, chiefly apples and pears, are to be found existing in gardens situated near the old abbeys and monasteries. That such kinds were introduced by the ecclesiastics, cannot admit of a doubt. The *Arbroath oslin*, which seems nearly allied to the *burknot* apple of England, may be taken as an instance; that apple having long been known all around the Abbey of Aberbrothwick, in Forfarshire, and tradition uniformly ascribing its introduction to the monks.

David I. had a royal garden at the base of Edinburgh Castle rock. He had an opportunity of observing the horticulture of England under the first Henry; and, we may reasonably suppose, says Mr. Chalmers, that he was prompted by his genius to profit from the useful, and to adopt the elegant, in that agreeable art. Indeed, Fordun expressly mentions, that not only did the king use to superintend in person the culture of the above mentioned garden, but practised the engrafting of trees.

The greatest care bestowed on the culture of fruits, and of some culinary herbs, by the nobility and clergy, could not fail to excite, in some degree, the curiosity and attention of the inhabitants in general; and it may perhaps be said, that the first impulse has scarce yet spent its force; for it is thus but comparatively a short time since the cultivation of apples, pears, cherries, gooseberries, and currants, as also many of the common kitchen vegetables, was introduced into the country. To a people naturally of a plodding turn of mind, and of a nervous and firm structure of body, it may be easily conceived, that gardening would soon become a desirable employment; and numbers would the more readily attach themselves to that occupation, on account of the total want of manufactures to employ the spare hands.

When ornamental gardening was more generally introduced into Scotland, in the end of the 17th and beginning of the 18th century, the stiff and formal style was naturally borrowed from the continent. The garden was laid out in squares, planes, and slopes; circles, ovals, and various angular and fanciful figures, with trees formed into particular grotesque shapes, and herbaceous plants disposed in the most precise arrangement. The prevalance of this sort of taste laid gardeners under the necessity of being somewhat acquainted with practical geometry; and indeed, it requires no slight knowledge of mensuration, to understand the writers upon gardening of those times. Thus it happened from necessity that gardeners became more acquainted with those subjects, than others of the same station; while the retired situation of the greater number of Scotch gardens, and the particular habits of the people, were circumstances favourable to the increase of that knowledge in the mathematics which might at first be acquired.

It may be remarked that owing to the national establishment of parochial schools, education in general has long been more widely diffused among the common people than in most countries. It thus happened, that the ordinary labourers in gardening, were almost universally initiated in reading, writing, and accounting, to which occasionally was added, some knowledge of geometry and land-measuring. Indeed, land-measuring to this day, is a branch which the peasantry look upon as particularly requisite to a tolerable education. It may be also stated, as an honourable trait in the character of the Scotch master gardeners of the last age, that it was a common practice among them, to spend a part of the evening in instructing their apprentices in different branches of education, particularly arithmetic, mensuration, drawing of plans, and botany, or the discrimination and nomenclature of plants. Even at this day, there are still in some places to be found the remains of this praise-worthy practice. A turn for reading and study was thus created among young operative gardeners; and to this their rise in life might in most instances be ascribed. Besides, in former times, there was in Scotland a very close connexion between gardening and the medical art. The gardener was the *skilly man* of his district; deeply read in the virtues of simples, and often applied to when the operation of blood-letting was to be performed. The superior order of Scotch gardeners still retain a very respectable share of knowledge as herbalists, and not a few study botany as a science. The taste for reading was perhaps never more prevalent than at this day. Nor do they entirely neglect geometry, though it must be admitted that this kind of knowledge is on the decline among the fraternity. It is not now nearly so necessary as formerly, to the professional gardener, ground being no longer planned into regular arithmetical figures, and topiary work being altogether exploded.

There are still other causes which may tend to make gardeners better informed persons than their equals in society, and to lead them to become, in some measure, acquainted with the nature of the more liberal studies; such as daily opportunities of conversing and consulting with their employers, and the visitors of their employers, and a frequent and very commendable practice of masters indulging deserving gardeners with ready access to their libraries.

In Scotland, besides, the head gardeners, in many instances, act as land-stewards or *grieves*, and the whole forest plantations of the country are under their direction. They are thus rendered persons of consideration, their office involving no slight responsibility.

Scotch gardeners possess yet another advantage. They are a hardy race, accustomed to labour, and able to undergo great fatigue, often while subsisting on fare, which would not only be thought homely, but scanty, in England. The great bulk of gardeners can neither fill their stations with advantage or satisfaction to their employers, nor with credit to themselves, without unremitting personal exertion; and in this virtue, Scotch gardeners very generally excel.

Besides attending to the usual labours of horticulture, the gardener in Scotland has a peculiar disadvantage to counteract—a very variable and unsettled climate. This, we consider, is a principal cause of their superiority, consisting in a perfect conformity with the nature and history of the human mind.

Difficulties and untoward circumstances elicit activity, enterprise, and experiment, and demand unceasing care and observation. Many curious devices are every where resorted to, in order to procure early and abundant crops of fruit, or of the more tender kinds of vegetables.

"——— It were long,
Too long, to tell the expedients and the shifts
Which he that fights a season so severe
Devises, while he guards his tender trust,
And oft, at last, in vain."—COWPER.

Numerous instances, however, occur, where gardeners, by means of such contrivances, are able to raise tolerable crops both of the more tender fruits and vegetables, in climates and situations very adverse to the production of either. A gardener placed in unfavourable circumstances, has doubtless more merit in accomplishing his object, even though the soil should be somewhat inferior in quality, than he who, in a propitious soil and climate, raises them to the utmost perfection. Yet the merits of the former are often overlooked. He also has acquired a skill and management, which when transferred to more favourable situations, will naturally take a lead, unequal talents being expended on an equal footing.

Though the alteration in the taste in gardening, and the substitution of imitations of natural scenery, in place of exact squares and faultless circles, and other characteristics of the geometrical style, have perhaps, as already observed, proved unfavourable to the literary character of the present race of Scotch gardeners, in particular so far as the mathematics are concerned; yet other very useful and elegant branches of horticulture have been introduced, that counterbalance this deficiency. The forcing of peaches, nectarines, and grapes, and the culture of the pine-apple, and other exotic fruits, require both the exercise of judgment, and close application, in forming soils, in regulating the temperature, admitting air, watering, and steaming. The practice of such operations must insensibly lead to the study of various departments of natural knowledge, as beautiful as they are beneficial.

It may therefore, with accuracy be stated, that the character of Scotch gardeners has not degenerated; but that at present, they exhibit in general profound skill in their profession, much practical information, sobriety, habits of unwearied diligence, a strong enthusiasm in the pursuit and ardent desire to excel. Impressed with the idea of the high character of Scotch gardeners, we naturally enter their gardens with raised expectations, and we very seldom retire disappointed. Weeds do not offend the eye; every thing is properly disposed; and the garden is generally productive in a very high degree. Or were one desirous of forming an opinion of them from another sort of display, the gardeners' procession on gala days, through the streets of Edinburgh would prove them to be, in point of taste and magnificence, the most imposing to be seen among all the trades that thus challenge admiration.

Take another criterion, by which to try the fraternity. It is allowed that Scotch agriculture is no where surpassed—that agriculture is but a more expansive and less minute art than that of horticulture—and that Scotch gardeners make the most successful of Scotch farmers. Behold a farm in one of the better cultivated counties of that country; say one of three hundred acres in the Lothians;—take it in winter, spring, summer, or autumn; or if there be not a neatness about the fences and ditches, a dressed appearance about every ridge—a total absence of noxious or luxuriating weeds even about the hedges, all which would almost be worthy of a villager's garden, not to speak of the more important marks of a skilful agriculturist, then we aver that the instance in question is an exception to the general rule, and the farmer a byeword among his neighbours. To our eye, nothing can be conceived that is more gratifying and beautiful in rural parts, than such farms. They cannot be viewed without an immediate experience of that delight which results from elegance, knowing that that elegance is of a character that must necessarily have been produced by skill, and where the social and moral virtues flourish. We have said this much of Scotch agriculture, because it is well known that it has made greater progress than even Scotch horticulture. But this fact goes as an indirect testimony to the credit of the latter. For much of the soil of the country is quite unfit for the raising of fruit trees: and the variableness of the climate, the sudden transitions from heat to cold, &c., the frequent frosts in the beginning of summer, when "winter lingers in the lap of May," form physical obstacles to the extensive improvement of horticulture in North Britain, to which the other branch of art is by no means so much exposed.

## VEGETABLE PRODUCTIONS OF BRITISH GUIANA.

In a pamphlet recently published, written by John Hancock, M.D., "On the Climate, Soil, and Productions of British Guiana, and on the Advantages of Emigration to, and Colonising the Interior of that Country," we have such an account of natural riches as may well entice emigrants thither as to a paradise. The author, it appears, enjoyed unusual opportunities to judge of the interior of a country that has previously been only known by name. He tells us, that he sojourned from the year 1804 to 1828, inclusive, in South America, and chiefly in British Guiana, where he followed his profession as a medical gentleman. And with the view of acquiring some knowledge of the botany of a country most rich in medicinal plants, and of some peculiar practices followed with great success by the inland tribes, he frequently visited the interior by the rivers Essequibo, Demarara, Poomeroon, Orinoca, &c. On one occasion he proceeded more than a thousand miles amongst the rivers, forests, and savannahs, and he presumes that no one, even Waterton, Hilhouse, or Baron de Humboldt, has ever traversed the country more extensively than himself. As his attention was especially directed to the divers medicinal substances of barks, roots, gums, balsams, &c. so abundantly produced in that region (he also treats in a rambling yet interesting style of many other circumstances), and as the character of our journal is of a specific kind, we shall confine ourselves to such notices as exclusively belong to the vegetable kingdom.

It is necessary, however, first, to know what the author says about the diversity of soil in different parts of British Guiana. The following are the principal:—First, the clayey or alluvial marshy land of the coast. This extends usually six or eight miles inland, which the Dutch in a great measure robbed from the sea, and which, till cultivation counteracted its influence, was an unhealthy settlement. Secondly, the hills of sand and gravel, with some intervening morasses, extending to the falls. Thirdly, the deep soil of the interior, which, the author says, both the Dutch and English planters have heretofore been ignorant of. Of this interior, he considers, that the treasures are still buried riches. He declares it to be a fact, that these remoter lands will produce far more sugar, coffee, cocoa, &c. than the sea-coast, and that with half the labour. On the coast, the sugar-cane commonly grows to the height of six or eight feet, but the author declares that inland, its growth often exceeds thirty feet, and is so luxuriant, that the tree often falls, and stretches to a great way on the ground; and all this nearly while in a state of nature, or without culture. He maintains that no land can be better adapted for the vegetable products already named, together with cotton and indigo, but that many others will thrive here most prosperously.

"No soil can be more congenial for the produce of dates, figs, olives, and grapes of superior quality, as proved by the Friars of Carony; as well as for the various aromatics and spiceries, such as nutmeg, cloves, ginger, allspice, and cinnamon. From the illiberal policy of the Spanish Government, and old Spain being the country of grapes and olives, the cultivation of these and various other products was prohibited in Spanish Guiana. This is the natural soil of the odoriferous vanilla, which

has been taken to Martinique and sold at from fourteen to twenty dollars the pound. Dycing woods, cochineal, wild honey, gum copal, &c., abound in the forests, beside a multitude of treasures unknown to Europeans.

"Many of our most valuable and expensive medicines, moreover, could be cultivated here with facility; as opium and ipecacuanha, which would give a quick return. The more humid parts would likewise produce the invaluable Sarsa de Rio Negro (*Smilax siphilitica)*, which doubtless, with a little research, might be found growing wild.

"It is not improbable that some of the more febrifuge species of cinchona (Peruvian bark tree) would be found on the mountain Mackerapan, or others of the elevated range of Parime. But whether found indigenous or not, this would afford a proper soil for its cultivation, which would be desirable now that the cinchona forests on the declivity of the Andes are becoming exhausted.

"The Rubiaceous Plants are especially numerous in Guiana. There are several different species of coffee growing wild in the interior parts, as well as of the Cephalus genus, of which the true ipecacuanha is one; and there can be no doubt that the cinchona will likewise be found, all these being of the same natural family. Another tree (of a new genus perhaps) found in Pomeroon, and descibed by the writer, affords a tonic and febrifuge bark, not inferior to cinchona. See Med. and Phys. Journal for January 1833.

"Besides all this, no country in the world abounds more in valuable timber-trees for ship-building, cabinet work, &c. It is here worthy of remark, that the forest trees do not impede those of humbler growth. The coffee, vanilla, and various others, even require the shade of other trees. In this respect, the tropical regions differ from those of higher latitudes, although this fact has hitherto scarcely been known or apprcciated, and we see the most valuable timber and fruit trees wantonly sacrificed in clearing the lands in equinoctial America.

"The nutritive vegetables, too, I must now observe, are grown in great abundance in the interior; as yams, cassada, plantains, sweet potatoes, Indian corn. Of the latter, there is one sort, called Maiz de dos Meses, which, as its name imports, yields in two months from the time it is committed to the ground. The return of Indian corn is often 2000 to one amongst the Macoosis."

The climate of the interior of British Guiana, which may be easily arrived at by means of the numerous large rivers that intersect it, is described as healthful in the extreme—and by no means intolerably hot; and the natives are friendly so long as they are treated as rational beings. But we must keep by the vegetable productions: for as Humboldt announced, when on the Rio Negro, these lands are a *new world* of plants: he having been confounded by the profusion of new vegetable forms. In reference to the nutritive vegetables, our author observes, that sago might be prepared in Guiana, as well as in the east, from several species of palm, as the eta, manicole, mountain cabbage, &c. and that the tapioca, so highly prized in England, is nothing but the *farina de manioc*, divested of the woody fibre by sifting, and that it might be procured in abundance, it being the entire farina of cassada, instead, as is erroneously supposed, the mere starch. Still speaking of the interior, the author goes on to say, "The timber on these lands would at least repay the trouble of clearing them. It would be advisable, perhaps, to allow many of the larger trees to remain, especially the more valuable fruit-trees; such, for instance, as the assepoca, boroway, touruneru, which belong to the *Sapotaceæ*, and of which natural family there are many others unknown to botanists; they bear delicious fruits, and furnish timber of great value: as also the anowary *(Pekea tuberculosa* of Aublet), which bears in vast abundance one of the richest and largest nuts in the world; it is much used by the inland tribes, and it is justly esteemed by them as highly alimentary and restorative. The Acqueru is a palm of moderate size, the fruit of which affords an abundance of a sweet bland oil, of a golden yellow colour, and of the finest quality. The large sweet and juicy fruit of the oubudi, *Anacardium giganteum*, affords a delicious wine, and its bark is of great use as an application to foul ulcers. Although this country has been but little explored, it is rather extraordinary that this fruit, one of the finest of the American continent, should still remain totally unknown in Europe.

"The daalie, or wild nutmeg (a true species of *Myristica*), abounds in the interior, and furnishes a vegetable tallow, which forms excellent candles, and, with an alkali, a soap of the finest balsamic quality. Here are numerous species of *Cassia*; the Caoutchouc, which gives the valuable elastic resin, and a multitude of gum resins. The Haiowa, or incense tree (*Amyris amrosiaca* of Willdenow), perfumes the forest with its salutiferous balsam; and the great Siruba tree not only furnishes the finest timber in the world for ship-building, but also, by incision, a camphoraceous ethereal fluid, a product which, so far as we know, is without a parallel in nature. The Maatua, besides a pleasant fruit, yields a nutritive vegetable milk, of the same flavour and appearance as cow's milk, or the fluid from the *Palo de vaca.* This tree (Maatu) I found on the banks of Reponony.

"The grapes grown in the interior are most delicious, and as much sweeter than those of Europe as the seasons are warmer. Wheat, potatoes, and all the European fruits, no doubt, would flourish on the mountains of Mackcrapan, where a cool climate might be attained in a few hours from the banks of Essequibo.

It appears from our author's account, and indeed from various other authorities which he adduces, that not only in respect of numberless products useful in medicine and the arts, but likewise numerous fruits, nutritive vegetables, and timber-trees, Europe has yet to become acquainted with the regions of South America. The notice offered in these pages of the timber and fruit trees in British Guiana, presents a wonderful idea of fertility and novelty. We shall, therefore, at the risk of occupying an undue space, introduce the account, only premising that the author gives sometimes the native names, because we have no others, their botanical history being little known, and because such a mode of distinguishing them is alone useful for readily identifying or finding, through the natives, any tree wanted.

"Considering the enormous expenditure incurred by Government for supplying the British navy with timber for ship-building, as now obtained from North America and the Baltic, it might be an object highly worthy of attention to establish a naval arsenal or depôt in the Colonies, where abundant materials might be obtained at comparatively trifling expense: and no part of the world, perhaps, offers so great advantages to this end as the united colonies of Essequibo, Demarara and Berbice.

"It is well known that vessels built in Brazil are of a very superior description in respect to strength and durability. Guiana furnishes, for the most part, the same woods, and many others unknown to Europe. I shall here briefly enumerate a few of the more valuable timber-trees which are best known in the Colonies, and employed either in ship-building, for colony craft, or in the construction of houses. Beside these, are other finer species of wood, which might be sent to Europe as most valuable for cabinet work, turnery, and household furniture.

"Of woods mostly employed, I shall first give the result of Reports drawn up by practical shipwrights of long experience in the construction of schooners and colony vessels; the first nine, following, being from their Reports, nearly *verbatim*, adding only a reference to the genus or botanical affinities, so far as known.

"'1st. *Seperi* or *Green-heart.* This is a remarkably fine-grained and hard wood, well adapted for vessels' planking. Can be had from twenty-four feet to fifty, squaring from twelve to twenty inches, well calculated for all water-works.

"'2nd. *Mora* (*Mimosa* sp.) This wood is the same as the celebrated Teak of the East Indies, and equal, if not superior, to Oak (not subject to dry rot, in the tropics at least). It

can be obtained in lengths from thirty to fifty feet, and squaring from fourteen to twenty-four inches. The crooked timbers of this tree and the planks would be of the greatest utility for keels, knees, and planking of the upper works of the largest vessels in the navy.

" '3rd. *Sawary* (*Pekea tuberculosa*, Aubl). This is of nearly the same nature and properties as the above, except that it cannot be obtained in such lengths, but in many other respects equally eligible, and usually squares something larger.

" '4th. *Bully-tree* (*Achras balata*). This tree is of a dark purple hue, hard, and well calculated for beams, posts, or uprights, &c.; it can be obtained of various lengths, and will square from twelve to twenty-two inches.

" '5th. *Sirwabali* (Fam. *Laurineæ* or *Ocoteæ*), three or four different species*. This is a lighter wood than those above described, and is remarkable for a peculiar aromatic bitterness which it contains, and acts as a preventive to the attack of worms. This is the wood of all others preferred in the Colonies for planking of craft, and on that account is well adapted for the construction of long-boats, gigs, &c., or any other works subject to be attacked by worms. This wood floats.

" '6th. *Crabwood Carapa Guianensis*, Aubl.) This is a light and red wood, generally used in the colonies for floors and partitions. This wood *also floats*.

" '*Purple Heart* is one of the scarcest and most valuable woods to be found in nature; its dimensions are large, and its qualities are superior to any other wood in sustaining the shocks occasioned by the discharge of artillery. At the siege of Fort Bourbon in Martinique, this wood stood the *test*, while all others failed, as mortar-beds.

" '8th. *Tonkin Bean* (*Diptera odorata*, Willd.) This is a very hard wood, fit for the cogs of wheels, or any thing that requires great pressure.

" '9th. *Cabacally* is similar to Bully-tree in most respects, and little inferior to it, being very hard and durable.'†

" *Carana* Cedar of the woodcutters (*Icica altissima* of Aublert.‡) A very large tree, the wood of which abounds with resin. It is light, and much like Deal, but far more durable, and of a reddish colour. It would probably be a most excellent material for the masts of vessels, being sixty or seventy feet in length, and four or five feet diameter. Bark red, very astringent, and excellent for tanning. Abundant through interior Guiana.

" *Wallaba.* A most durable reddish-brown wood, full of an oily resin. It splits smooth and freely, and is universally employed in the colony for covering houses, for water-vats, &c.: it is the *Eperua* of Aublet; Willdenow calls it *Panzeri.* It attains about sixty feet in height, and three or four in diameter; bears a large sabre-shaped legume.

" *Nacoca Iron-wood* called Palo Santo by the Portuguese, a large leguminous tree (*Robinea panacoco*, Aubl.) The bark of this tree, as Aublet observes, is employed in sudorific ptisans; it is rough, thick, and gives out a red balsamic liquor. The wood is reddish brown, becoming black by age: it is hard and compact: in great esteem at Cayen in the construction of vessels. It is regarded as incorruptible, according to Aublet, who says, he had seen pieces of this wood which remained sound after having lain partly buried in the ground for more than sixty years.

" * One of these (the yellow Sirubally) is the rose-wood, *bois de rose*, which exhales a fragrant odour.

" † The leaves of this tree are remarkably fine or small; and a singular coincidence is generally observable between the texture of the wood and size of the leaves amongst the tropical vegetables, in the trees especially, so that, on seeing a leaf, we can form a very probable idea respecting the degree of hardness or solidity of the wood. I have no idea of the classification or botanical analogies of this tree, the Cabacally.

" ‡ From this tree it is that the balsamic odorous resin, called *carana*, is procured, the source of which has heretofore been a matter of conjecture.

" *Pucheri* and *Waibyma*, large trees of the Laurel kind; excellent timber: abound on the mountains of Repononi. Specimens of the bark of Waibyma brought by the writer in 1811, are still strongly aromatic: used by the natives as a remedy in fevers and dysentery.

" The *Yari-yari*, a small tree, grows slender and straight (*Anoniaceæ*). This is the Lance-wood, already known here to coach-makers as the best material for the shafts of carriages, and which, they say, from its toughness or elasticity is not subject to be broken.

" *Yarury*, a large tree, the roller or paddle-wood. This, probably, might furnish the best material for floats or paddle-wheels of steam-vessels, as being, although light, exceedingly strong and elastic; and not being subject to splinter, it might also prove superior for gun-carriages, and for the bulwark of ships of war. The lower port of the trunk grows into singular fluted or flat tabular projections, forming cavities or compartments, capable of holding several persons. Other trees of the tropics occasionally assume a similar structure, as the *Mora*, and some large fig-trees, which occasionally serve the natives as ready-made planks for floors, tables, or benches. The Yarury appears to be a nondescript both in genus and species. It pertains to the fifth class and first order of Linnè's system. Its curious fruit and capsules may be seen at the Med. Bot. Society's rooms, Sackville-street, noted in my botanical memoranda, under the title of *Yarura tabularia*, The bark of this tree is very bitter, and has been employed as a substitute for the cinchona with great success by Dr. Burton.

" *Simiri* of the Arowaks (*Hymenæa courbaril*). A very hard and compact wood, used for mill-rollers. On the higher lands it yields great quantities of copal, or a resin scarcely distinguishable from it. It is singular that the guttiferous trees seldom give out their exudations on the coast, which they do abundantly inland.

" The *Bicy* or *Besie*, of which the Indian corials and canoes are chiefly made, is of great durability, and is, like the Siruba proof against the worm. This tree, or a variety of it, yields a singular green resin, which might be applied to valuable purposes as a varnish.

" A species of wild Orange, called by the natives *Waranana*, a timber-tree, grows large in Pomeroon, Supinam, &c.

" *Oubudi.* The wood of this tree is white, soft, and only fit for heading sugar hogsheads, boards for wainscoting, &c.: unless cut down about the time of new moon, when the sap is said to be down,* it is subject to be perforated by the borer (*Teredo*) and other small worms.

" The *Macorypong* (?), the tree which bears the Ackawai nutmeg, so termed, (of the mountain regions), is said to be durable timber, but is chiefly prized for its large aromatic and astringent fruit, which is considered to be one of the most efficacious remedies in diarrhœa and disentery, colic, and spasmodic pains. Its botanical history is entirely unknown; but Dr. Lindley, who has inspected the fruit, regards it as pertaining to the natural order *Laurineæ.*

" *Bannia*, a dark brown and very hard wood, similar to ebony. *Ducalibali*, and *Letter-wood*, one of the most precious and beautiful of ornamental woods; as also *Hobobali*, and numerous other fine woods, adapted for cabinet work and turnery, and for divers other ornamental purposes.

" The common fruits of the tropics are so abundant in Guiana, that the wild or native ones are not attended to, and remain mostly unknown: the *Pacory*, a species of Garcinea, or Mangosteen, gives out a grateful perfume. It grows to a large tree on the Pomeroon, Tapacoma, and divers parts of the colonies. Its wood is employed for planks and framing, and its large ap-

" * This remark applies more or less to all timber. It is founded on the experience of the woodcutters; and, in fact, common observation proves that the lunar influence is far more sensible in equinoctial countries than in high latitudes, on the weather, vegetation, &c.

ple is eaten by the natives; yet to this time it remains unknown, perhaps, as to botanical affinities, or its alliance to the prince of East India fruits. The tree is replete with a yellow gum, like gamboge: but the true *Stalagmitis cambogioides* (or a near species) is also found near the coast, a small dicœcious tree, observed aback of the Richmond and Lima estates."

He subjoins a list of thirty more trees, many of which he declares either bear edible fruits, some of them very delicious, or are, with few exceptions, valuable timber. Nor can the reader but have his mind filled with a great idea of the beauties, the wonders, the bounties of the Creator's power and goodness, on reading the account.

## DESCRIPTION OF THE PLATES.

### HIBISCUS GRANDIFLORUS.

LARGE FLOWERED HIBISCUS.

Monadelphia Polyandria.—Lin.

Malvaceæ.—Jus.

Stem, frutescent. Stipules, straight. Leaves, palmate, 5-3 fid. Bracteas, 9-10, erect, linear. Flowers, axillary, solitary.

In affinity this species comes nearer to *H. Cannabinus*, *Radiatus*, and *Ficulneus*, than any others; from the first of which it may be distinguished by having no gland on the principle nerves of the leaves; and, from all of them by its exceeding woolly calyx. It flowers luxuriantly in August and September; but though its corolla is fine and gorgeous, yet, as it forms a rambling prickly shrub, it is little esteemed here. In New Holland, it has been used for making ropes.

### PROTEA TENAX.

TOUGH PROTEA.

Tetrandria Monogynia.—Lin.

Proteaceæ.

Stem very tough, pale green, tinged with red. Leaves, grey, red toward the bottom, linear, lanceolate, flat, attenuated at base, roughish at edge. Middle nerve very thick and conspicuous. Fasciculas of flowers erect, two inches or more in diameter. Bracteas of the involucrum yellowish green, tinged with red; the upper ones spatulate, obtuse, minutely silky, and ciliated. Pollen, pale yellow. Stigma, exceedingly narrow, four grooved.

It thrives best in a soil composed of light turfy loam, mixed with rather more than one-third of fine sand; the pots must be well drained with broken potsherds, to prevent them from getting soddened with too much water; the roots are also very fond of running amongst the small bits of sherds. Ripened cuttings, taken off at a joint, and pared quite smooth, will take root, if planted thinly in pots of sand placed under a hand-glass, but not plunged: the glasses must be often taken off to give them air, as they are very liable to get the damp amongst them, which soon spreads, if not cleared off, and destroys them.

### BOUVARDIA TRIPHYLLA.

THREE-LEAVED BOUVARDIA.

Tetrandria Monogynia.—Lin.

Rubiaceæ.—Jus.

Stem a foot high, erect, roundish, somewhat three-angular, and, while tender, minutely hairy, the branches in each whorl of different lengths. Leaves generally in threes. Petioles very short. Lamina broadly ovate, cuneiform, rough at the margin, smooth, except the upper surface of the middle nerve. Stipules, sheathing between the petioles, divided into one or two dagger-shaped segments, besides smaller teeth. Flowers without scent, erect. Panicle terminal, closely corymbose. Peduncle from five to six inches long, 3-7 flowered. Pedicle in threes, or opposite, the upper ones shorter, and the last middle flower often sessile. Calyx, yellow-green. Corolla-tube whitish at the lowest base, from thence scarlet, its inside paler, and nearly white towards the top. Limb, scarlet. Anthers, pale yellow. Style, white. Stigma, very pale scarlet. Seeds, blackish brown,

This very beautiful and not very tender plant, which flowers great part of the year, is best preserved in an airy glass frame during the winter, for it is more hardy than many Mexican plants. It rarely produces seeds; but may be propagated readily by cuttings.

### RHODODENDRON CHRYSANTHUM.

GOLDEN-FLOWERED RHODODENDRON.

Diandria Monogynia.—Lin.

Rhododendra.—Jus.

The stem seldom exceeds a foot in height, sending off numerous decumbent spreading branches, having their ends emerging from the moss, and which are covered with a brown bark. The leaves are terminal, few, ovate, oblong, of a coriaceous texture, and attenuated to the footstalk; the upper ones reticulated, and of a deep green colour; the under pale or subferrugineous. The flowers are large, yellow, and placed alternately at the ends of the branches on very long peduncles, forming an umbel. They are unusually six or fewer, but sometimes about ten, erect and hairy. The capsule is ovate, somewhat angular: subtomentose, and divided into five or ten cells, which contain many small, gray, irregular seeds, like saw-dust.

This beautiful shrub is a native of the mountains of Siberia, Kamschatska, and Beering's Island; flowering in June and July, ripening its pods in September, and is propagated by layers.

The leaves possess a smell, when fresh, of a rhubarb cast; when dried they are inodorous, but have an austere bitterish taste. The decoction has a disagreeable smell, and a rough, bitter arid taste. This decoction the Siberians, on the banks of the river Lena, when overcome by fatigue and cold, apply to their limbs to relieve pain and induce sleep.

### RHODODENDRUM OFFICINALE.

OFFICINAL RHODODENDRUM.

Decandria Monogynia.—Lin.

Rhodomceæ.

Root penetrating among rocks and stones. Stem from 6 to 18 inches high; round, viscid-pubescent while young. Buds large. Leaves dark green, crowded near the extremity of the branches: from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches long, and about 1 inch broad, spreading somewhat obovate, very entire, obtuse; finely reticulated on their upper suface, underneath viscid-pubescent while young, especially on their nerves; afterwards smooth. Flowers from 6 to 10, in very short terminal spikes, nodding. Bracteas viscid, pubescent. Fruit tinged with red, viscid-pubescent, except the melliferous callus at its base.

This beautiful evergreen is a native of the alpine regions of Siberia. It is cultivated with the greatest difficulty by layers.

### AMARYLLIS LONGIFOLIA.

LONG-LEAVED AMARYLLIS.

Hexandria Monogynia.—Lin.

Amaryllideæ.

Root a tunicated bulb. Leaves radical, sparse; outer ones recurved-recumbent, glaucous, broad-subulate, convolute at their bases. Scape strict, roundish, solid, lateral, or outside the leaves, and produced after these are completely grown out, varying from 6 inches to 2 feet in breadth. The flower-stem rarely rises more than three or four inches high, but supports a great number of flowers, of a deep purple colour; appearing in December.

Native of the Cape of Good Hope. It requires to be kept on the flue of the stove, in a largish pot, and light earth, and will increase pretty fast by offsets when properly managed.

Hibiscus grandiflorus.

Protea tenax.

Bouvardia triphylla.

Rhododendron chrysanthum.

Rhododendrum officinale.

Amaryllis longifolia.

## GARDENING OPERATIONS FOR SEPTEMBER.

This is, in general, a very agreeable month—the distinguishing softness and beauty of autumn, with its deep blue skies, prevailing through great part of it. The days are very sensibly shortened, and the mornings and evenings are chill and damp, though the warmth is still considerable in the middle of the day. In late years a good deal of corn is abroad, especially in the northern parts of our island: but it is supposed that all will be at least cut by the first of the month, for partridge-shooting begins at this time; for these birds frequent corn-fields, and have a safe refuge while the corn is standing.

A remarkable product of the earth, collected in this month, is saffron. This is cultivated in various parts of Europe, but none is superior, we believe, to that which is grown in England, chiefly in the counties of Essex and Cambridge. The saffron-plant is a species of crocus, which is planted in July, and the flowers gathered in September. The part which alone is used, is the branched filaments on the inside of the flower, called the chives. It is properly an expansion of the female part of fructification, or pistil. These are picked off, dried, and pressed together into cakes. They are of a high orange colour, and have a strong aromatic odour. Saffron is used in medicine as a cordial; and its flavour was formerly much esteemed in cookery. It gives a fine deep yellow dye.

Very few other flowers open in this month; and it is to the ripening fruits that we are chiefly indebted for the variegation of colour in the landscape of nature. The labours of the husbandman, too, have a very short intermission; for no sooner is the harvest gathered in, than the fields are again ploughed up and prepared for the winter corn and crops, which are chiefly sown during this month and the next. At this time it is proper to straiten the entrance of bee-hives, that wasps and drones may have less opportunity of getting in and devouring the honey. It may be added to these general notices of nature during September, that the autumnal equinox, when day and night is again equal over the globe, happens towards its close. This, as well as the vernal, is generally attended with storms, which throw down much of the fruit and crops yet remaining on the trees and fields. By the end of the month, the leaves also of many trees have their verdure impaired, and begin to put on their autumnal colours, which, however, are not complete till the ensuing month.

### *Kitchen Garden.*

Plant some common cabbage lettuce, in a well-sheltered situation, exposed to the mid-day sun, to be covered with hot-bed frames and glasses, which should not be put over them till some time next month. Plant broccoli, savoys, bore-cole, celery, and cardoons. Tie up the leaves of endive with a piece of bass mat, to blanch them, and prepare them for the table. Mushroom beds may be formed any time this month, as spawn will very easily be procured during the month. The spawn has the appearance of a white mould shooting out in strings, which, when bruised, smells like mushrooms. It may be obtained either from old mushroom beds, old hot-beds, or from any place where horse or sheep dung has lain for some time undisturbed, and may be preserved for a considerable period, in a proper state for using. If spawn is not otherwise to be procured, it may be produced by laying a quantity of horse-dung and rich earth in alternate layers, and covered with straw, to exclude the rain and air: the spawn will appear in about two months after the dung and earth have been laid together. Mushroom beds should be formed of dung that has been spread out for some time, without having been fermented, and may be made two or three feet broad, and of any length. A stratum of dung, about a foot thick, should be laid first, and this should be covered with rich earth to the depth of about four inches, then another stratum of dung about ten inches thick, which should be covered like the former; a third stratum of dung may be added and covered with earth in the same manner. The whole should be made narrower as it advances in height, and formed into a ridge resembling the roof of a house. When the bed is finished, it should be covered with straw, to exclude rain, and to prevent the bed from being dried by the sun or wind. In this situation they should remain eight or ten days, when the bed will be in a proper temperature of warmth to receive the spawn. The spawn should be placed in lumps, four or five inches asunder, in the sloping sides of the bed, and covered with a little rich earth; the whole must then be covered with a thick coat of straw. The principal thing to be attended to in the management of these beds, is to preserve them in a proper degree of moisture and warmth. Therefore, when the weather is very cold or very dry, care must be taken to apply a thick covering of straw, and when the bed appears dry, a gentle watering must be given. It may be added, that when spawn is once procured, it may be extended or propagated, as spawn, without producing mushrooms. A quantity of cow-droppings is to be gathered from the pastures; some rotten wood, or spray from the bottom of a hedge, is to be collected, with a little strong loam. These are mixed and formed into a moist ductile sort of mortar or paste, of such consistence that it can be cut into pieces like bricks. When these are so far dried that they can conveniently be lifted, a row is laid in some dry place, under cover, perhaps in a shade at the back of a hot-house; a little spawn is placed upon the layer, then another layer of the spawn-bricks, and so on. In a few weeks the whole mass is penetrated by the spawn. The spawn-bricks may then be laid aside for use: they will keep many months, and the drier they are kept, the more certainly do they afford a crop of mushrooms, when placed in favourable circumstances for so doing. However strange it may seem, and without at all abetting the doctrine of equivocal generation, we still assert our power of producing spawn at pleasure.

Turnips sown in the former month should now be hoed in a dry day: let the plants be hoed out regularly about seven inches apart, and cut the weeds up clean. If it be required, continue to sow rape, white mustard, turnip, and cress, for small sallading. Sow it in small drills in an open spot of ground. The stems of artichoke plants which have been blowing, should be cut down, and the ground about the plants cleared of weeds; indeed, in any part of the kitchen garden, care should be taken not to allow any sort of weed to bring its seed to maturity. Any seeds of curious esculent vegetables that are ripe should be gathered in a dry day.

### *Fruit Garden.*

When any fruit, particularly grapes, are shaded with leaves, care should be taken to expose them to the rays of the sun, that they may acquire a proper flavour. Strawberries may be planted any time this month when the weather is moist. If any were planted into beds in June, they will be in excellent condition for planting out now; but if not, the best rooted plants produced at the joints of the runners, or offsets from the old plants, should be chosen, and planted at the distance of a foot or fifteen inches from one another, or in rows along the borders. Most kinds of strawberries succeed best in an open situation, but the wood strawberries may be planted under the shade of trees or bushes. About the end of the month most of the late peas and apples will be fit for gathering. It is a sign that these and other fruits are ripe when they begin to drop from the trees. Apples are now gathered for our English vintage, the cider-making, which, in some counties, is a busy and important employment. The apples are taken fresh from the trees, or after they have lain awhile to mellow, and then they are crushed in a mill, and also pressed, till all their juice is extracted. This is set to ferment, whence it becomes a delicious beverage, which may be called *apple wine*. Pears, treated in the same manner, yield a vinous liquor called perry. We may mention another agreeable product of our thickets as

well as gardens, during this month—the hazel-nut. The acorns begin now also to fall from the oak, and the nuts from the beech. But we are going into Nature at large, and must return to our narrower department. If it be required to make plantations of fruit-trees, now is the time to make preparations for the work.

*The Flower and Pleasure Garden.*

Transplant and propagate fibrous-rooted perennial plants by slips. Towards the end of the month, hyacinths, tulips, and other bulbs, may be planted. You may now plant box-edgings; and where they have grown clumsy and thick they ought to be taken up and replanted. But this work had better be deferred till late in the month, unless the weather be moist and cloudy. All sorts of edgings may be clipped any time in the month. Mow and sweep grass walks once or twice a-week, and weed and roll gravel walks frequently. This month is a good time to save flower seeds, if they are ripe.

*The Nursery.*

Transplant evergreens towards the end of the month, such as Portugal laurels, laurustinus, arbutus, &c. Both evergreens and deciduous trees and shrubs may be propagated by layers or cuttings about the end of September. A variety of young tender trees and shrubs in the pots, about the same period, should be removed into a sheltered situation, that they may be protected during the winter from inclement weather.

*Green-house and Hot-house.*

Towards the close of the month, if the weather be cold, orange and lemon trees, and many of the tenderer kinds of green-house plants, should be removed into the house. The hot-house must be put into proper repair, the tan-beds refreshed, fires, it may be, will be required, and numbers of plants shifted for their winter quarters.

## BUTESHIRE.

Buteshire is on the west coast of Scotland, lying in the Frith of Clyde, and is composed of the islands of Bute, Arran, Great Cumbrae, Little Cumbrae, Inchmarnoch, Holy Island, and Pladda. The island of Bute is sixteen miles west from Greenock, thirty-eight from Glasgow, and eighty-three from Edinburgh, though the usual route to these places is four or five longer. The extent of Bute, from north to south, is fifteen miles, while its medium breadth is little more than three; but it is much indented with bogs, which alter greatly the breadth of different points. It is separated from the district of Cowal, in Argyleshire, only by a long and narrow channel, about half a mile broad. The more southerly part of the island lays off Ayreshire, at the distance of from five to seven miles; but the channel of the Clyde is much narrowed here by the Cumbraes, which intervene. Arran lies off the south point of Bute, about eight miles distant, and Skipness, in Argyleshire, bounds it on the west, at about the same distance as Arran. The Butemen were in ancient times considered to be a distinct people, and refused to be reckoned as belonging either to the highlands or lowlands. The island contains 30,000 English acres, of which about two-thirds may be said to be arable. Towards Cowal it is bleak and hilly, although, upon the whole, it has rather a flat appearance. The southern parts, however, consist of green fertile eminences, either affording pasture, or capable, as well as the low grounds, of being cultivated, so as to produce excellent crops of barley, oats, &c. Indeed, it has been maintained that the word Bute is derived from an original, which signifies the Island of Corn, or Food, from its being more fertile than the adjacent highland counties or islands. At any rate, Bute is distinguished altogether for picturesque beauty and salubrity of climate. Neither mists nor crawling fogs infest it: snow seldom lies for any considerable time upon it. In respect of its genial and healthy climate, Bute is frequently compared to Devonshire, and, in some particulars, is considered superior. The high mountains of Arran and Argyle, by attracting the clouds that are carried by the south-west wind towards the mainland, leave Bute comparatively free, although it is liable to sudden severe rains. In summer, the air is kept cool by the sea-breeze, and in the winter the same cause prevents intense frost. It has for many years been the place of summer resort, for sea-bathing and ruralizing, to the fashionable mercantile gentry of the west.

There are six lakes in the island, on the banks of the water flowing from several of which there are, and might be many more, public works erected. The soil of the island is, in general, light and sandy; but when properly managed, it is well suited to every kind of husbandry. Of late years agriculture has, under the fostering care of the Marquis of Bute, who is proprietor of by far the greatest part of the island, made considerable advances, especially in the middle and southern divisions: but there is abundant scope for much greater progress still, in this department of Bute. The capital of the farmers, till late years, instead of being laid out in improving their lands, was chiefly employed in the herring fishery, a business which afforded a more speedy and lucrative return. Lands were thus allowed to run waste for want of cleaning, or were impoverished by an almost constant rotation of cropping, with little or no manure. A course of unsuccessful years, however, have reduced the number of vessels employed in the herring business, and a spirit of emulation has in its stead grown up, in reference to agriculture, which, together with the patronage and encouragement of the Marquis of Bute and others, is producing the most pleasant effects in the rural economy of the islanders. Most of the land is now enclosed and subdivided by means of ditches and thorn-hedges of a superior appearance. Nor is it to be doubted that, ere long, the island will bear comparison, in respect of its farming and crops, to the most flourishing parts of the kingdom.

Plenty of limestone, and some freestone and coal, are found in Bute. Inexhaustible beds of shells are to be met with on the west side of the island, and considerable quantities of sea-weeds are driven in upon its shores. Upon one estate, slate has been pretty extensively wrought. The chief mercantile produce consists of barley, oats, potatoes, turnips, and artificial grasses, which flourish here uncommonly well. There is a ready market at Greenock and at Glasgow for these articles, as well as for cattle. And now that steam-vessels are constantly plying from Bute to these and other large and thriving ports on the coast of the mainland, the island has all the advantages of proximity, as regards its relative position in reference to trade. Excellent banks for white fishing are to be found all around the island, but which are neglected for the sake of the herrings, which are of a superior quality. Lobsters, crabs, and oysters, though abundant, are seldom procured. The island is also well stocked with hares, partridges, snipes, green and grey plovers. It has plenty of ducks, teal, and other sea fowl common to the western coast of Scotland, and in some winters a great abundance of woodcocks.

The view of this interesting island from the sea is enlivened by the cottages that have tastefully been sown, as it were, in the many declivities, that are everywhere stretching their graceful effects in the most picturesque manner. There is little or no extent of sea-beach; the waves wash the base of grounds, having a heathy or grassy covering to the very edge of the water. Mount Stuart, the seat of the Marquis of Bute, is an elegant mansion, surrounded by a forest of fine trees, commanding a splendid view of the Frith, and the shipping of the Clyde.

The burgh of Rothsay, the capital of the island and shire, is beautifully situated at the head of a deep bay, on the north-east side of the island, where there is safe anchorage ground for any size of vessel, and during any wind, as also room for a large fleet. The shipping belonging to this port carries upwards of 4000 tons. There is a large spinning factory in the town, driven by water from one of the lakes;

and it may be mentioned, that the second mill erected in Scotland, for the spinning of cotton, was upon the same water, only about fifty-six years ago, when the business was carried on with the strictest secrecy. The island is divided into two parishes: Rothsay containing a population of 6,084, and Kingarth 746; thus making 6,830, exclusive of seamen, who amount to between 300 and 400.

Arran is an island of heathy mountains, especially its northern half. The mountains are either round-backed, or somewhat peaked, and some of them rise to about 3000 feet above the level of the sea. The southern part of the island is lower and hilly, numerous crags and cliffs diversifying the surface. The valleys in the northern parts, however, are deep, rocky, and much more romantic. The geognostic structure and relations of Arran are remarkably interesting; but these are matters we must leave to other parties. But whilst it is a valuable mine to the mineralogist, it abounds so much with the proper orders and style of highland scenery, as to afford a fine field for the botanist. There is comparatively little wood in Arran; and yet it is about twenty miles long, and eleven broad, containing about 106,000 English acres, 15,000 of which only are arable. Near Brodick Castle the only plantations worth naming are to be found. The climate in winter is very severe, and generally moist; but, in summer, the air is salubrious; and the extremes of heat and cold are not so distant as in places similarly situated on the main land.

Agriculture was much neglected in this island till of late; every farm being occupied by a society of tenants, among whom the arable part was divided in small lots, and the pasturage grounds and moors were a common under one herd; but now there has been a general subdivision introduced, and several large farms made out of a host of small ones, into which enterprising tenants, from the lowlands, have carried all the improvements which soil and climate can admit of. There has been, in consequence of this, and other causes which it is needless here to enumerate, a great emigration from Arran to America of late years; yet the inhabitants are remarkably attached to their native soil. They are all Protestants, and strongly attached to the Church of Scotland. The language spoken by the natives is Gaelic, but most of them now understand English.

The island produces the usual crops of the west of Scotland. But, when speaking of the pursuits of the islanders, we cannot but notice and lament, that illicit distillation has been and still is practised to an extent seldom equalled in the neighbouring islands. The smugglers give a better price for the grain that is thus used, than the tenants can obtain in any other way, and hence a demoralizing, and, in the issue, a profitless tendency and traffic is kept up. Nor is it unworthy of remark, that from the prevalence of this unlawful employment, the natives have acquired a reserved and suspicious manner, which is apt to strike strangers, and which is greatly to be deplored, among a people otherwise primitive, simple, and moral in their disposition and habits.

Kelp is manufactured in Arran in considerable quantities. Most of the woollen cloth used on the island is manufactured by the women of it. The herring fishery is beneficial; and, to return to the whiskey illicitly distilled, it is excellent. There are one or two licensed distilleries, however, where a spirit, not much inferior to that which is dealt in by smugglers, is manufactured; and which, together with other surplus produce, finds a ready conveyance to the main land, and the towns on the shores of the Frith of Clyde. The island comprehends two parishes, and its villages are Lamlash and Brodick, at both of which there is an inn. There are three places of worship, and three schools. The population is 6,427, besides a few seamen belonging to registered ships. The island belongs, with slight exceptions, to the Duke of Hamilton.

Great Cumbrae is an island about two miles and a half long, and one and a half broad. It has a gentle ascent of about 400 feet, from the sea to the centre. It forms one parish, along with Little Cumbrae, which is about half a mile distant, being about a mile long, and half a mile broad. Three or four families live on it. The capital, in the larger island of the two, is Milnport, a neat, small place on the north side, with a harbour, and tolerable anchoring ground, sheltered by a rocky islet. Freestone, limestone, and coarse linens are the exports. The life and bustle of this sea-port offer an agreeable variety to the tameness of the Cumbrae scenery.

The other three islands we have mentioned, as forming part of Buteshire, do not require from us any particular notice. Inchmarnock is low-lying, small, and beautiful, about a mile to the west of Bute. It is about a mile long, and half a mile broad, containing three farms, nearly one half of which is arable. Pladda is about a mile south-east of Arran, on which there is a light-house, which directs the mariner to one on Little Cumbrae. Holy Island is a hilly rock, bearing a resemblance to Arthur Seat at Edinburgh, and covering the harbour of Lamlash, on the south-east side of Arran.

The population of Buteshire, in 1831, amounted to 14,134, besides seamen belonging to registered ships. The county returns one member to the House of Commons. Its different islands present not a few interesting subjects for the antiquarian, as well as the historian; but the only other fact we shall notice, regarding these islands, belongs to their picturesque character, which is of no mean order; uniting with the neighbouring highlands and lowlands, so as to confer on the scenery that lines, or is thrown into the throat of the Frith of Clyde, the most variedly rich and magnificent features and objects that can strike the eye of the tourist.

## ON WILLOWS, OR OSIERS.

We have, in our paper on the Gardens within the Environs of London, alluded to the osiers that grow on the banks of the Thames, and upon the small islands in that river, between Staines and Fulham. It may be useful to mention some particulars as to the specific names of those raised in these places, the uses to which they are applied, and the manner of their culture. Willows are a most useful article in domestic and rural economy, not to speak of the various beautiful manufactures to which they are appropriated by tradesmen; they are also, on particular soils, by far the most profitable crop, and, therefore, what we are going to extract from Foot's Middlesex, on the subject, must be interesting to many persons.

As to the specific names of the willows, or osiers, raised at the places above alluded to, we learn, that the *Salix vitallina*, or yellow willow, is cultivated chiefly by the nurserymen; and, being of a tough and yielding nature, it is used for binding packages of trees and shrubs in the drawing season, and for tying up the branches of wall and espalier trees.

The *Salix amygdalina*, or almond-leaved willow, is a species of which there are several varieties; one of which is called, by the planters, "the small red willow," or "binding rod," it being chiefly used for binding the produce of garden grounds. Another kind of this willow is of a large growth, and produces a great crop. It is used both by the basket-makers and the corn-sieve-makers, and is fit for any work which requires a firm as well as a tough rod.

The *Salix viminales*, or osier-willow, has also several varieties, which are called, among the planters, by the names of "the yellow and brown osiers," or, "Comb's osiers." They are chiefly used by the basket-makers, being very pleasant working rods; and, as they produce a great crop, are much cultivated. These three descriptions comprehend the most useful varieties, and are the most profitable, in point of crop, of any that are cultivated in the district mentioned. There is, however, a coarse sort of willow, known by the name of "the Spaniard," which might be rendered extremely useful in counties where much brush or underwood is bound.

The mode employed in the cultivation of willows is as follows:—The ground is, during the winter, dug a full spade's depth, and left rough, to prevent the tides from running it together again before it can be planted. The planting work begins in the month of March. The planter having procured the sets or plants, which are fifteen or sixteen inches long, cut diagonally off the strongest shoots of the last year's growth, and care being taken that they are not cut near to the top of the rods, that part being too porous to make a sound plant, the ground is then marked out into rows, two feet asunder, and the sets are stuck into the rows, eighteen inches from each other, leaving about seven inches of the sets above the ground. The work is very easily done, without using even a dibble or setting stick; but when planted, care must be taken, by hoeing, to keep them as free from weeds as possible; or, if the ground be too wet for the hoe, a weeding-hook may be used to keep them down: this is absolutely necessary, to insure a good plantation. It is also equally necessary to keep the ground well drained, to prevent the tides remaining upon it any considerable time, for on that also depends the firmness and good quality of the rods.

The willows are cut the first year with a bill-hook; the shoots are cut off close to the stock, and bound up in bundles, or boults, as they are called, which measure forty-two inches round, at sixteen inches above the butt ends. The same process of weeding must be pursued every summer, while they are shooting up from the stem. The next cutting season a portion of them is left to stand another year, where large stuff is wanted for the ribs of large baskets, &c.

The planting of willows is expensive the first year, but if well managed, they produce a great profit, as they improve in quantity every year. Willow-planters, however, preserve an unusual secrecy with respect to their profits, nor have we learned what may be the value even of one of the "boults" of the first year's growth. There is, in general, a great demand for willows, while there are also a vast number of situations throughout the neighbourhood of London where they might be advantageously cultivated. We hope, therefore, that calling the attention of practical gardeners, and other cultivators of the soil, to this point, will not be without some good results.

## HISTORY OF THE COTTON MANUFACTURE.

The power and the greatness of Britain could not be more successfully illustrated or proven than by the history of its cotton manufactures. It is a splendid and immense evidence of the genius, the conquest, the riches of this country. The rapidity and extent of its increase are without a parallel in the annals of the world. Were we to fix on single proofs of our assertion, how better could we do than say, that the families supported now by this branch of industry are estimated to comprise a *million and a half* of individuals. And what more need there be quoted to prove the rapidity of its increase, than that sixty years ago our manufacturers consumed little more than *three* million lbs. of raw cotton annually, and that the consumption is now *two hundred and eighty* million lbs.? Were we merely to consider the wonderful inventions in machinery which have been called forth in its progress, it would be evident that nothing had ever surpassed the magnitude of revolution in the annals of industry thereby effected, and that nothing but the art of printing could excel the example. The manufactures of wool and linen combined do not equal it. By means of inventions and discoveries, a spinner now produces as much in a day as by the old processes he could have produced in a year; and cloth which formerly required six or eight months to bleach, now requires only a few hours.

India is the birthplace of the cotton manufacture; yet England has done much more than regenerate the art, for it has conferred on it perfectly new capabilities. But of its ancient history we are greatly in the dark; for as the growth and manufacture of cotton were confined to the regions beyond the Indus, in the times of antiquity, there are nothing more than the slenderest allusions made to the clothing made from it, by the Greek and Latin writers. Compared with wool, silk, or flax, cotton, though the last to be generally diffused, is now the most useful material for clothing. It possesses downy softness and warmth, and its delicate fibres are sufficiently long, flexible, and tenacious, to admit of being spun into an extremely fine thread. It is produced both from annual plants and from trees, of which there are many varieties; and under proper cultivation it is the cheapest of all the materials of clothing. Indeed, in many respects it has the advantage over any other. Cotton being a bad conductor of heat, preserves the body at a more equal temperature, accumulates less moisture, and absorbs more than linen; and therefore in cold, as well as in tropical climates, is more suitable to the body.

We pass over the early history of the cotton manufacture in Asia, Africa, and America. We merely state, on the authorities relied on, that it was first introduced by the Moors into Spain in the tenth century, at a period when the rest of Europe was involved in intellectual darkness. It was carried into Italy in the fourteenth century, where, however, it does not seem to have attained any reputation or extent of manufacture. Indeed, owing to the defectiveness of the machines and tools, it had both a slow extension and an inferior rank throughout Europe, till the age of invention in England. The truth is, that the same sort of fabrics that are now in repute never existed till they were made in England. The distaff and spindle continued in all countries previously to be the instruments for spinning. The apparatus for weaving was as simple and inartifical as that for spinning, considering the more complicated nature of the instruments; at any rate, as little improvement was effected upon it for a great extent of time. But at length a brilliant series of mechanical inventions took its rise in this country during the last age; so that now it may safely be declared that the experiments and improvements made by humble mechanists have added more to the power and wealth of England than all her colonies have ever done, or are capable of yielding. It is a secure and never-ceasing source of riches and strength; it is now an inborn and salient principle, that is as much a piece and parcel of our national knowledge and character as valour and intelligence are. The importance and interesting nature of the task we have undertaken to elucidate cannot therefore be too highly appreciated.

To trace the origin of these inventions, then, must be an inquiry of national interest. What could be more discreditable to the literature of the country, than that it should fail to preserve a record of such high achievement in science and art—of so great a boon to the world and to posterity? Yet the age in which they were actually made, has passed over without even an attempt to perform this duty. The inventors themselves were too busy, and too unaccustomed to the use of the pen, to commemorate the fruits of their genius; and the writers of the day were unconscious of the great revolution in industry that was silently proceeding. The very few authors who have since touched upon the subject, finding the materials so scanty, have compiled brief and most unsatisfactory notices, containing many serious errors.

The extent of the triumph gained in this manufacture over that of India, which at one time was the cause of great alarm to the English woollen and silk manufacturers, is an unparalleled instance of revolution, and of one country surmounting another on borrowed grounds and with imported weapons. M. Charles Dupin, in an address to the mechanics of Paris, says:—

"Watt improves the steam-engine, and this single improvement causes the industry of England to make an immense stride. This machine represents, at the present time, the power of three hundred thousand horses, or of two millions of

men, strong and well fitted for labour, who should work day and night without interruption, and without repose, to augment the riches of a country not two-thirds the extent of France. A hair-dresser invents, or at least brings into action, a machine for spinning cotton; this alone gives to British industry an immense superiority. Fifty years only after this great discovery, more than one million of the inhabitants of England are employed in those operations which depend, directly or indirectly, on the action of this machine. Lastly, England exports cotton, spun and woven by an admirable system of machinery, to the value of four hundred millions of franks yearly. The Indies, so long superior to Europe—the Indies, which inundated the west with her products, and exhausted the riches of Europe—the Indies are conquered in their turn. The British navigator travels in quest of the cotton of India—brings it from a distance of four thousand leagues—commits it to an operation of the machine of Arkwright, and of those that are attached to it—carries back their products to the East, making them again to travel four thousand leagues; and, in spite of the loss of time, in spite of the enormous expense incurred by this voyage of eight thousand leagues, the cotton manufactured by the machinery of England becomes less costly than the cotton of India spun and woven by the hand near the field that produced it, and sold at the nearest market. So great is the power of the progress of machinery."

England, although almost last in the race, has outstripped every competitor in the manufacture of cotton. In the manufacturing districts of England and Scotland, water-power, fuel, and iron, are physical and natural advantages probably not to be obtained in any country to the same extent and amount. Ready communication with the sea, and easy access to whatever the whole kingdom possesses, are advantages which Lancashire enjoys in a particular degree. The position of Britain, in a commercial point of view, between the north and south of Europe, a temperate climate, and a hardy race of men, is singularly favourable to manufacturing industry. Then the political and moral advantages are not less conspicuous; peace, liberty, and the security of personal property, are around the men of enterprise in England; whilst other countries, being unfavourably circumstanced in these respects, have not merely been crushed or hindered from fully developing their energies, but have supplied us directly with persons of skill in branches which were previously in their infancy in this country, by their taking shelter under our equitable laws. The cotton manufacture found also a congenial soil in England, inasmuch as that of wool and flax had been long established, and prepared the way for its introduction and perfection.

Cotton was at first used in England for candle-wicks; but the exact period when its manufacture into cloth was introduced is unknown. No mention has yet been found of this most important use of it earlier than the year 1641; nor can it be supposed that it could have existed very long before that date. At that time, however, it had become well established in Manchester, supplying the home trade with several kinds of cotton goods, and furnishing also a regular article of exportation from the metropolis to the distant markets of the Levant. Nevertheless, up to the year 1760, the machines used in the cotton manufacture of England were nearly as simple as those of India.

Without by any means attempting to enumerate the several successive steps gained in the progress of the cotton manufacture, a few examples will abundantly shew their rapidity and extent, although we will have to mark amid what obscurity the subject often remains as to the real author or inventor of the most efficient improvements that have ever taken place. The claims of those who have done the highest service to art, by the new lights which their genius has thrown out, are often disputed or denied;—the melancholy fate of others, who have been ruined by their devotion to the pursuit of great achievements in discovery and invention, cannot but affect us in spite of the splendour of the aggregate results that have attended a people's enterprise and skill.

Let us just note the progress made in spinning. The one-thread wheel, which for a time was the only machine employed in spinning, though much improved above the rude instrument used in India for the same purpose, was yet an extremely slow working article. It only admitted of one thread being spun by one person, and consequently rendered the yarn expensive.

Genius stepped in to remove the difficulty, and gave wings to a manufacture which had been creeping on the earth. A mechanical contrivance was invented, by which twenty, fifty, a hundred, or even a thousand threads could be spun at once by a single pair of hands!

The authorship of this splendid invention, like that of the art of printing, has been the subject of much doubt and controversy; and by far the greater number of writers have subscribed the honour to an individual, who, though possessed of extraordinary talent and merit, was certainly not the original inventor. Sir Richard Arkwright is generally believed, even to the present day, to have invented the mode of *spinning by rollers*. It can be proved, by a piece of evidence the most unquestionable, and which has never yet been published, that the invention was made, and was the subject of a patent, *thirty years* before it is pretended that Arkwright had conceived it. The inventor, it is true, did not succeed in making his own fortune, or even in introducing his machine into general use; he wanted the *primum mobile*, pecuniary means, and could not hold out long enough to realize the success his genius had merited. The invention slumbered for nearly thirty years, till it was either re-discovered, or, what is more probable, till its principles came accidentally to the knowledge of Arkwright, whose keen sagacity appreciated its value, and whose perseverance, talent, and good fortune, enabled him, by its means, to enrich himself and his country.

This mode of spinning has been applied also in the woollen and flax manufactures; the inventor of which was John Wyatt of Birmingham, and not Arkwright. The patent was taken out in 1738, in the name of Lewis Paul, a foreigner, with whom Wyatt had connected himself in partnership; the latter, probably from embarrassed circumstances, appearing only as a witness.

Having thus stated that the *principle* of Wyatt's invention was the same as that of the spinning frame brought into use by Arkwright, it may be added, that the *details* of the Birmingham machine were far from being perfect, and that the machine differed greatly from Arkwright's in its form and construction. That it was imperfect appears manifest from its having failed to become profitable. It was tried by Wyatt and Paul, at Birmingham, between 1738 and 1743; an engine of a similar kind was erected in the latter year at Northampton, with capital supplied by Mr. Cave; and so late as the year 1758 we find Lewis Paul taking out a new patent for the spinning machine, with some improvements; yet none of these succeeded. This lingering existence of the invention leads us to suppose that it was not uniformly unprofitable, but that the profits were small, and generally more than swallowed by the expenses. The proprietors saw that they were in possession of a great and valuable principle; but, probably from a deficiency of capital, and from the want of continued application on the part of Wyatt to the perfecting of the details, it yielded no fruit to him whose happy genius first conceived so admirable a process.

It was Arkwright who successfully introduced the spinning rollers, and who, though not entitled to all the merit which has been claimed for him, possessed very high inventive talent, as well as unrivalled sagacity, in estimating at their true value the mechanic contrivances of others. He combined them together, perfected them, arranged a complete series of machinery, and constructed the factory system—itself a vast and admirable machine. He was one of those men whose works have conferred inexhaustible riches upon the nation, and who,

though born of very humble parents, was destined to become one of the greatest benefactors of the human race. He was the youngest of thirteen children, and his education was so defective, that he was scarcely able to write. His trade at first was that of a barber; but he had a strong bent for experiments in mechanics, and an extraordinary good luck in receiving assistance to forward his views. It was in the year 1769 that he took out a patent for his spinning machine, he then being thirty-seven years of age. But the ignorance and jealousy which even he had to encounter is a striking illustration of features in human nature that unhappily are conspicuous at the present day, in reference to similar departments.

Arkwright, though the most successful of his class, had to encounter the animosity of his fellow-manufacturers in various forms. Those in Lancashire refused to buy his yarns, though superior to all others, and actually combined to discountenance a new branch of their own manufacture, because he was the first to introduce it. He has related the difficulties with which he had to contend in his 'Case.'

"It was not," he said, "till upwards of five years had elapsed after obtaining his first patent, and more than 12,000*l.* had been expended in machinery and buildings, that any profit accrued to himself and partners." The most excellent yarn or twist was produced; notwithstanding which the proprietors found great difficulty to introduce it into public use. A very heavy and valuable stock, in consequence of these difficulties, lay upon their hands; inconveniences and disadvantages of no small consideration followed. Whatever were the motives which induced the rejection of it, they were thereby necessarily driven to attempt, by their own strength and ability, the manufacture of the yarn. Their first trial was in weaving it into stockings, which succeeded; and soon established the manufacture of calicoes, which promises to be one of the first manufactures in this kingdom. Another still more formidable difficulty arose; the orders for goods which they had received, being considerable, were unexpectedly countermanded, the officers of excise refusing to let them pass at the usual duty of 3*d.* per yard, insisting on the additional duty of 3*d.* per yard, as being calicoes, though manufactured in England; besides, these calicoes, when printed, were prohibited. By this unforeseen obstruction, a very considerable and very valuable stock of calicoes accumulated. An application to the commissioners of excise was attended with no success; the proprietors, therefore, had no recourse but to ask relief of the legislature: which, after much money expended, *and against a strong opposition of the manufacturers of Lancashire*, they obtained.

It was fortunate for the Lancashire manufacturers that their gratuitous maliciousness to the establishment of a new branch of their own trade, was unsuccessful. A series of inventions, comprising the carding, drawing, and roving machines, were afterwards improved upon, and applied by Mr. Arkwright, of which he claimed to be the inventor, and which gave an unwonted impulse to the cotton manufacture. The factory system next took its rise.

Hitherto the cotton manufacture had been carried on almost entirely in the houses of the workmen: the hand or stock cards, the spinning wheel, and the loom, required no larger apartment than that of a cottage. A spinning jenny, of small size, might also be used in a cottage, and in many instances was so used: when the number of spindles was considerably increased, adjacent work-shops were used. But the water-frame, the carding-engine, and the other machines which Arkwright brought out in a finished state, required both more space than could be found in a cottage, and more power than could be applied by the human arm. Their weight, also, rendered it necessary to place them in strongly-built mills, and they could not be advantageously turned by any power then known but that of water.

The use of machinery was accompanied by a greater division of labour than existed in the primitive state of the manufacture; the material went through many more processes; and, of course, the loss of time, and the risk of waste, would have been much increased, if its removal from house to house, at every stage of the manufacture, had been necessary. It became obvious that there were several important advantages in carrying on the numerous operations of an extensive manufacture in the same building. Where water power was required, it was economy to build one mill, and put up one water-wheel, rather than several. This arrangement, also, enabled the master spinner himself to superintend every stage of the manufacture: it gave him a greater security against the wasteful or fraudulent consumption of the material; it saved time in the transference of the work from hand to hand; and it prevented the extreme inconvenience which would have resulted from the failure of one class of workmen to perform their part, when several other classes of workmen were dependent upon them. Another circumstance which made it advantageous to have a large number of machines in one manufactory was, that mechanics must be employed on the spot, to construct and repair the machinery, and that their time could not be fully occupied with only a few machines.

All these considerations drove the cotton spinners to that important change in the economy of English manufactures, the introduction of the factory system; and when that system had once been adopted, such were its pecuniary advantages, that mercantile competition would have rendered it impossible, even had it been desirable to abandon it.

Arkwright's prosperous career was remarkable. Wealth flowed in upon him. For several years he fixed the price of cotton twist, all other spinners conforming to his prices. In 1786, he was appointed high sheriff of Derbyshire; and having presented an address of congratulation from that county to the king, on his escape from the attempt of Margaret Nicolson on his life, Arkwright received the honour of knighthood. He died in 1792, in his sixtieth year.

## OF THE GARDENS WITHIN THE ENVIRONS OF LONDON.

This, it must be confessed, is a wide field, and can only be treated by us in a general way, and by short notices of certain leading objects falling under the term gardens. In our general view of the present state of these gardens we may observe, that, according to Fuller, the culture of vegetables for sale, in this kingdom, appears to have been about the year 1590; and that, previous to this time, a mess of *rath-ripe*, or early pease, was a dainty for ladies—they came so far, and cost so dear. Gardens, for the raising of vegetables for sale, were first cultivated about Sandwich, in Kent. The example was soon followed near the metropolis, whose markets are the chief vent for their produce. In proportion as this great town has increased in population and opulence, the demand for every species of garden luxury has increased also; and, from time to time, fields have in consequence been converted into garden ground, till a considerable proportion of the land, within a few miles of London, became occupied for that purpose. The culture of garden-ground is principally confined to those parishes which lie within a moderate distance of the river, on account of the convenience of water-carriage for manure; which, since the prodigious increase of carriages, as well of hackney and stage coaches, as of those kept by private families, is procured in great abundance from the London stables.

It is not easy to ascertain what extent of ground is occupied by gardens in the vicinity of London. It has been said, that there are about five thousand acres, within twelve miles of the metropolis, constantly cultivated for the supply of the London markets with garden vegetables alone, exclusive of potato ground, and of that which is used for fruits of other kinds, and other sorts of gardens. But, owing to the extension of the suburb streets, the occupation of that which has

been garden-ground by brick-fields, and other varying circumstances, no precise estimate can be given of the land devoted to the style of culture we are treating of. Lysons, in his Environs of London, says, exclusively of the five thousand acres cultivated for the supply of vegetables, there are eight hundred acres cropped with fruit of various kinds, and about seventeen hundred for potatoes, besides twelve hundred more with various garden vegetables for the food of cattle, principally cows. This culture is carried on most extensively in the parishes of Camberwell and Deptford, St. Paul's, by persons who are called farming gardeners. Their method is, to manure their land, to the highest pitch of cultivation, for garden crops, both for the market and for cattle; after a succession of which, they refresh it by sowing it with corn. Mr. Lysons refers to the close of the eighteenth century, when the above statement was given; but, in a supplement to his work, published in 1811, he says, "There are now at least sixteen hundred acres occupied by nurserymen and seedsmen; and that there are, even within six miles of London, fourteen hundred acres so occupied. The physical herbs, also, take up several hundred acres."

We shall not, however, trouble our readers with any farther calculations as to the extent of garden-ground near London, of which no one who has either traversed the vicinity of such an overgrown city, or been early enough awake in the morning to witness the enormous waggon-loads of vegetable productions brought to town, can fail to have a just conception. Indeed, when we consider that much more distant parts than the environs of London can embrace, are devoted to such a centre of life and wealth, it could not serve our present purpose to be more precise than we have been. We proceed, therefore, to take notice of some other particulars, which are not less interesting than that of the vast extent of ground occupied as gardens.

Before speaking of fruit, kitchen, and nursery gardens (or market gardens, as these are often called), connected with London, we shall refer to the extent and excellence of two other sorts of gardens that distinguish the same parts, viz., those belonging to royalty and botany.

The Royal Gardens at Kew, on the banks of the Thames, are perhaps the finest in the world for variety of plants. They were originally planned by the father of George III., and extend to about 120 acres. The surface is flat, but owing to the tasteful disposition of trees and shrubs, there is a considerable variety of scenery. The exotic garden was established about the year 1760, chiefly by the influence of the Marquis of Bute, who placed it under the care of Mr. William Aiton, who had long been an assistant to the famous Philip Miller. The principal green-house and orangery is 145 feet long, 25 high, and 30 broad. There is another green-house, for the reception of African and Cape plants, 110 feet long; and a number of other hot-houses of various descriptions. The garden contains no fewer than 839 feet in length of glass; besides, about one-half of the houses have covered borders in front, for the protection of different kinds of bulbs and alpine plants during winter. The palm and fern tribes, the plants of New Holland, and those of China, have each their appropriate hot-houses, transporting the visitor to their respective worlds.

The Royal Gardens at Hampton Court are eminent in their own style, which is old, and prior to that of Kent and Brown. Here there is a labyrinth, the walks of which are about half a mile long, within the space of half an acre. There is also a famous Black Hamburgh vine, more than a foot in circumference in its stem, and one branch measures 114 feet in length. This plant has produced in one season 2,200 branches, at the rate of one pound each. The Kensington Gardens are also celebrated; as also those at Frogmore, near Windsor, formed chiefly under the direction of Charlotte, queen to George III., and the Princess Elizabeth, one of their daughters.

The Botanic Garden at Chelsea is supported by the Company of Apothecaries of London. The ground was granted, at the close of the 17th century, by Sir Hans Sloane, on condition that the Royal Society should be presented annually with fifty new plants, till the number amounted to 2,000. Philip Miller, who was superintendent of this garden for many years, composed his great and valuable Dictionary here. There is a botanical library kept at the garden, and during summer, lectures are delivered by a demonstrator, appointed by the Company of Apothecaries. We now come to the Fruit Gardens.

Besides a number of considerable fruit-gardens on the Surrey or South side of the Thames, they are so continuous from Kensington, through Hammersmith, Chiswick, Brentford, Isleworth, and Twickenham, that on both sides of the road, for seven miles and more in length, the land may be called the great fruit-garden, north of the river, for the supply of London. The fruit-gardens have two crops growing on the same ground at one time, and what are termed an upper and under crop. First, the ground is stocked with apples, pears, cherries, plums, walnuts, &c., like a complete orchard, which is the upper crop; and secondly, it is fully planted with raspberries, gooseberries, currants, strawberries, and all such fruit, shrubs, and herbs as are known to sustain the shade and drip from the trees above them with the least injury: this is of course the under crop. Some of these gardens have walls which are completely clothed with wall-fruits, all properly adapted to the aspect of the wall. In order to increase the quantity of shelter and warmth in autumn, they raise earthen banks of about three feet high, laid to a slope of about forty-five degrees to the sun. On these slopes they plant endive in the month of September; and near the bottom of them, from October till Christmas, they drill a row of peas. By this means the endive is preserved from rotting, and, as well as the pease, comes to maturity nearly as early as if they had been planted in borders under a wall.

The management of these gardens is in general excellent; a wonderful degree of labour and skill is expended upon them, for which a proportionable produce is reaped, averaging upwards of 100 pounds per acre. It is calculated that each acre requires five persons in winter, and in summer ten, to do the labour requisite; while the market-people, porters, basket-women, dealers, and hawkers, may be estimated at five more. Were we to add the extent of land, and the number of hands employed in the other counties besides Middlesex, which we have just been speaking of, and to calculate what is done in Surrey, Kent, Essex, Berks, &c., we should derive an amazing idea of the fruit-gardens in connexion with the London market.

Kitchen-gardens, which we next come to speak of, lead us to observe, that the richest ground for this purpose that is perhaps to be met with in the kingdom, is at what are called the *Neat-houses*, which lie between Westminster and Chelsea. This soil, no doubt, originally consisted of the sediment deposited there from the richly impregnated water of the Thames, and, like the other marsh land on both sides of the river, is secured against inundation by embankments. In the situation now under immediate consideration, the occupiers can, by a little attention to the sluices, dip-holes, and wells, have Thames water, and detain it in such places to within about eighteen inches of the surface, and by that means save a great deal of labour in watering their crops. This land has been long in the occupation of kitchen gardeners, and for a length of time has been supplied with dung at the rate annually of upwards of sixty cart loads per acre. All kinds of vegetables are grown here, but chiefly those which early in the season bring a high price. The total annual produce has been calculated at 250*l.* per acre.

The farming gardeners, or those who work their soil principally with the plough, are situated at a much greater distance from London; the crops they cultivate are principally pease for foddering, and turnips, cabbages, carrots, &c., for Covent Garden market, and others in the metropolis. In Middlesex, Surrey, Kent, and Essex, many thousand acres are cultivated in this manner, producing per acre about 50*l.*

If from an inspection of Covent Garden green-stalls, one may judge of the general state of horticulture in Britain, it may be said to be near perfection. It cannot, however, be denied, that although the kitchen vegetables exhibited there excel in size, they are inferior in flavour to those raised at a distance from London. The prodigious quantity of manure that has for many years been replenishing the otherwise over worked land about the metropolis, communicates a grossness in which delicacy of taste is sacrificed for dimensions. There must, also, a very considerable length of time elapse between the gathering and the sale of the market vegetables; not to speak of the practice of hotel-keepers, who must often have occasion to keep their stocks as circumstances dictate, and from whose tables many strangers are apt to judge. At any rate, when flavour, freshness, and beauty are talked of, one cannot but wonder that the supply should be so excellent in London as it is, where the consumer has it not in his power to resort to his own garden, and gather as his necessity or taste may require.

Nursery gardens now claim our attention, in reference to the vicinity of London. These are very extensive and celebrated, and, to refer merely to Middlesex, may be seen to great advantage at Chelsea, Brentford, Kensington, Fulham, and Hammersmith, or to the north-east, at Hackney and Dalston. No sight more varied, rich, and beautiful, can be imagined, than the collection of rare flowers and ornamental shrubs, which are to be seen in many of these gardens, and the hot-houses attached to them, and which have been gathered from every quarter of the globe; so that to attempt a particular description of them here would be a useless labour. Every variety of fruit and timber tree also, that can be cultivated in this country, is to be found in these nursery grounds. Many of their productions are annually exported to Ireland, Spain, Portugal, Italy, Russia, and even to France; but there are still greater quantities sold for use in this country. It has been said, a number of years ago, that in Middlesex alone there were 1,500 acres of nursery-ground, and that, including the hot-houses and green-houses belonging to them, they produce about 70*l.* sterling per acre annually. On the banks of the Thames, and the small islands in that river, between Staines and Fulham, a very considerable profit is made by the cultivation of osiers for the basket-makers.

With a few miscellaneous notices we shall conclude this paper.

London is an emporium to which the surrounding country, far and near, sends its horticultural produce, and yet it may be asserted that the demand is seldom satisfied. Upon this account the supply of the market in this particular branch should be extended and encouraged, especially since it is found to hold true, as remarked by the celebrated horticulturist, Mr. Knight, that the palate which relishes fruit is seldom pleased with strong fermented liquors, and that, as feeble causes continually acting ultimately produce extensive effects, the supplying the public with fruits at a cheap rate would have a tendency to operate favourably both on the physical and moral health of the people. It may not be tiresome, should we name the identical places where a few individual garden productions are extensively cultivated. The districts of Brentford and Twickenham are famous for strawberries. Near Deptford much asparagus is raised, as also in Mortlake parish. These, when produced early, bring prices high in proportion, that is, six or seven shillings per hundred. Very early potatoes bring three and sixpence per pound, and peas, when they first come in, are a crown, and even half-a-guinea a pottle—a measure less than a quart. These and other culinary plants are extensively forced by the London market-gardeners, being forwarded either in a hot-bed or flued pit. At one place eighty acres may be seen covered with asparagus beds, which cannot be incredible to any one who has seen the loads of this particular article that for months are heaped on the stalls of the metropolitan dealers. Many acres in the neighbourhood of Deptford are used for the raising of onion *seed*, and as there produced, it has obtained a great reputation throughout the kingdom. And, not to go farther into minute matters in treating of such a large subject, we shall merely mention, that what are denominated the *physic gardens* are chiefly near Mitcham, nine or ten miles from Westminster Bridge; in these are raised chamomile, lavender, liquorice, rhubarb, wormwood, and, above all, peppermint, not only for the supplying essential oil to apothecaries, but for the manufacturing of a favourite cordial.

## BOTANY OF THE ISLAND OF JAVA.

We have been at considerable pains of late to gather the most recent accounts of the vegetable kingdom in the various and most distant regions of the globe, not merely for the purpose of affording information to botanists, but to impress the general reader with an idea of the marvellous abundance of beauties and provisions which Providence has created for the support, the culture, the instruction of mankind.

The soil of Java is as remarkable for its richness and its depth, as it is for the great abundance and almost infinite variety of its productions. As to agriculture, the Javans are all, more or less, interested, as rice is not only their principal diet, but a conspicuous article in the export commerce of the island. Indeed, they have been called, and are emphatically, "a nation of husbandmen," and the whole island is a great agricultural garden. The whole country, as seen from mountains of considerable elevation, appears a fertile, diversified, and well-watered territory, animated by villages, interspersed with the most luxuriant fields, and covered with the freshest verdure. The prospect is not confined to rice fields alone; it is occasionally relieved by corn-fields of yellow maize, and enclosures of palma christi, cotton, tobacco, indigo, sugar-cane, coffee plants, pepper vines, and gardens *rich in vegetables* of almost every description. Of fruits, we will name the mangusteen, or mangoostan, the most fascinating to the eye, and gratifying to the taste, of all the fruits in the east, or perhaps the world. The mango, which grows on a large spreading tree somewhat like the English walnut, and has a delicious flavour. The rambootan and the poolasang, or red fruit, which are cool and agreeable, of a delicate subacid flavour, and quite refreshing in a tropical climate. The cocoa-nut, tamarind, pomegranate, rose-apple, guava, annona, date, banana, jack-fruit, doorian, durian, or duren, boa-lanser, pine-apple, lanseb, papaw, custard-apple, &c. Oranges, citrons, shaddocks, lemons, and limes, are plenty; and in some provinces, peaches, Chinese pears, and raspberries.

The flowers of Java are celebrated for their beauty and fragrance. There is a tree called the mitchelia tchampaca, of two varieties, one of which bears white and the other yellow flowers, of exquisite odour. The coral-tree puts forth large clusters of scarlet flowers; while the magnolia, the melia, and bignonia, present a showy and elegant appearance. Among the innumerable flowers which bloom in perpetual succession, are the champaka, tanjong melati-kananga, and nagasari, which are used by the natives as ornaments, and are remarkable for their fragrance. The myrtle and rose are found in the gardens of the Europeans.

Large tracts of the island, particularly in the eastern provinces, are covered with forests of that excellent timber called teak, which has long been celebrated for its strength and durability in ship-building, &c. It is said to be in these respects every way equal to live oak, and even superior in the fineness of its grain and beauty of its colour. It is of different shades, from light to intense brown, with a cast of violet, verging sometimes to red or black, and furnishes excellent materials for handsome cabinet-work. This tree is slender and erect; shoots up with considerable vigour and rapidity, but increases in diameter very slowly, and is many years, at least a century, in arriving at maturity. It neither loves the mountains nor the vale, but grows at a moderate elevation above the level of the ocean.

There are several other kinds of timber-trees employed for

various domestic purposes, many of which bear beautiful flowers of delicious fragrance. There are some resembling our red cedar, pitch-pine, white-wood, larch, hickory, ash, &c. There are others which resemble rose-wood and satin-wood. There are several which furnish excellent masts and spars for shipping. The kusambi is heavy, hard, and close, and is suitable for vessels' blocks, pestles, &c. The sawur resembles mahogany, but has a closer grain. The pilang is another very hard wood, and is employed instead of lignum-vitæ. The pung, equally hard, is used by builders for pegs, pins, and treenails. The janglot is considered by the natives as the toughest wood produced in the island, and is always employed for bows when procurable. In short, Java produces wood of nearly every texture, weight, and colour, and suitable for all purposes. There are but few resinous trees in Java, and the camphire-tree, which abounds in Sumatra, is here unknown. The bamboo, or bambu, or *pring*, found in all tropical countries, grows here in great abundance; and from the greater luxuriance and variety by which it is here distinguished, no doubt finds a soil peculiarly congenial to its growth. The rattans are said to be inferior to those of Sumatra.

Many other trees might be named, the various products of which are turned to many most useful purposes; such as the soap tree, and the wax tree. But we cannot allow to pass unnoticed the far-famed upas tree of Java, which a Dutch surgeon, in 1766, describes, giving its very location as being only eighty miles from Batavia. The result of Foersch's alleged investigation was published in an English dress, in the Gentleman's Magazine, in 1783; the Dutchman professes to have only related facts of which he was an eye-witness, having imposed upon the credulity even of literary men.

He says, "I have made the tour all around this dangerous spot at about eighteen miles from the centre, and I found the aspect of the country on all sides equally dreary." He conversed with the old Malayan priest who prepared the criminals to go on their perilous embassy after the poison, and was assured by him that out of great numbers he had sent, not more than one out of ten survived to return; with some of these the surgeon also conversed. He describes the upas tree as the sole individual of its species, standing alone, in a scene of solitary horror, on the middle of a naked, blasted plain, surrounded by a circle of mountains, the whole area of which is covered with the skeletons of birds, beasts, and men. Not a vestige of vegetable life is to be seen within the contaminated atmosphere; not even a solitary spear of grass; and that even the fishes die in the water. But of the progenitors of this finny tribe he gives us no information. The divinity of Darwin's muse has consecrated this fable in the following beautiful lines:—

"Fierce, in dread silence, on the blasted heath,
Fell Upas sits, the hydra-tree of death!
Lo, from one root, the envenom'd soil below,
A thousand vegetative serpents grow!
In shining rays, the scaly monster spreads
O'er ten square leagues his far diverging heads;
Or in one trunk entwists his tangled form,
Looks o'er the clouds, and hisses in the storm;
Steep'd in fell poison, as his sharp teeth part,
A thousand tongues in quick vibration dart;
Snatch the proud eagle, towering o'er the heath,
Or pounce the lion as he stalks beneath;
Or strew, as martial hosts contend in vain,
With human skeletons the whiten'd plain."

But as even the classic fictions of antiquity, when figuratively and rightly understood, have their origin in truth, so has this more modern Dutch fable of the bohun upas. Vegetable poisons, it is well known, exist in almost every part of the world, particularly in the tropical regions. On the Island of Java there are several different species of shrubs and plants which exude matter deleterious to animal life. To each of these the natives have applied the appellative *upas*, which is a word in their language signifying *poisonous*. Thus, the *ubi upas* means a *poisonous potato;* and the seed of a certain tree is called *upas bidjee*, in English, *poisonous seed*. But there is a tree, says Dr. Horsefield, common to the eastern provinces, and one of the largest trees in the forests of Java, from the sap of which a poison is *made*, "equal in fatality, when thrown into the circulation, to the strongest animal poisons hitherto known. The tree which produces this poison is the *anchar*, and grows in the eastern extremity of the island. The *anchar* belongs to the twenty-first class of Linnæus, the *monœcia*. The stem is cylindrical, perpendicular, and rises completely naked to the height of sixty, seventy, or eighty feet; at which height it sends off a few stout branches, which, spreading nearly horizontally, with several irregular curves, divide into smaller branches, and form a hemispherical, not very regular, crown. It delights in a fertile, not very elevated soil, and is only found in the largest forests. One of the experiments to be related below was made with the upas prepared by myself. In the collection of the juice, I had some difficulty in inducing the inhabitants to assist me; they feared a cutaneous eruption and inflammation, resembling (according to the account they gave of it) that produced by the ingas of this island, the rhus vernix of Japan, and the rhus radicans of North America. The anchar, like the trees in its neighbourhood, is on all sides surrounded by shrubs and plants: in no instance have I observed the ground naked or barren in its immediate circumference. The largest tree I met with in Balambangan was so closely environed by the common trees and shrubs of the forest in which it grew, that it was with difficulty I could approach it. Several vines and climbing shrubs, in complete health and vigour, adhered to it, and ascended to nearly half its height; and at the time I visited the tree, and collected the juice, I was forcibly struck with the egregrious misrepresentation of Foersch. Several young trees, spontaneously sprung from seeds that had fallen from the parent, put me in mind of a line in Darwin's Botanic Garden:—

'Chain'd at his root two scion-demons dwell;'

while in recalling his beautiful description of the upas, my vicinity to the tree gave me reason to rejoice that it was founded in fiction."

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## ON ROSES.

The rose, called by the ancients "the splendour of plants," must always have been a favourite with mankind, and accordingly we find it in many and various senses emblematic, showing that it has constantly caught the eye, and suggested images to the mind. It is from its superior beauty, appropriate to all tastes and all affections, whether tender, joyful, or melancholy. Piety has used it to adorn temples—love and gladness are fond of its glories—modesty beholds a similitude in its blushing sweetness—its fragrance is the emblem of richness—its scattered leaves, of grief—its thorns, of adversity and trial. But, before marking all its poetic and familiar characters, we shall hastily trace it, as employed by horticulturists, in a rosary, for in such a situation a variety of species have of late years been rising in repute. For this purpose, indeed, every hardy sort is now carefully cultivated. There are between three and four hundred varieties enumerated in the catalogues.

Most of the species of roses throw out suckers, and these may be removed in October for propagation, although the best way is to lay down branches, when they readily grow. We shall enumerate some of the species, and but a few of the varieties.

*Rosa Centifolia* (hundred-leaved rose), has many varieties; the blush, Dutch, and velvet, may be mentioned.

F F

*Rosa Gallica* (red rose); this is, when the petals are in an unexpanded state, used for making conserves.

*Rosa Damascena* (damask rose), the red and white monthly roses are varieties of this, as also the York and Lancaster.

*Rosa Provincialis* (Provence or cabbage rose); in fragrance and beauty it is hardly equalled. The scarlet, the white Provence, and the blush, are some of the varieties. Let the wood be cut down every year, and it will thrive the better.

*Rosa Muscosa* (moss rose), is always found by us in a double state. The moss-rose has of late years been much in the market, and we need not describe how captivating it is, especially before opening its paradise of leaves, when it speaks to the fancy rather than the sight.

"The rose is fairest when 'tis budding new,
And hope is brighest when it dawns from fears;
The rose is sweetest, wash'd with morning dew,
And love is loveliest, when embalm'd in tears."

*Rosa Alba* (common white rose), is lovely whether single or double; and has other beautiful varieties, such as the large, small, and cluster maiden blush.

*Rosa Sulphurea* (double yellow rose), seldom opens fairly. It seems to affect a cool or shady place; it is a distinct species from the single yellow rose (*Rosalutea*).

*Rosa Cinnamonea* (cinnamon rose), has an early variety, and is the smallest of the double roses.

*Rosa Rubiginosa* (sweet-briar rose), is a well-known species. It is the eglantine of the poets, and of its varieties may be named the common double-flowered, mossy double, marbled double, and red double.

*Rosa Moschata* (musk rose) flowers late, and climbs.

*Rosa Semperflorens* (deep red China rose), flowers for the greater part of the year, if planted in front of a green-house, or against a south wall.

*Rosa Indica* (Indian rose), is a wonderful acquisition to the horticulturist, being always in leaf, and very hardy. It flowers in March and November, and a variety of it has much fragrancy.

It is the fashion to form beds of roses in different shapes, in the lawn near the mansion-house, or the approach to the pleasure grounds. The circle or oval form is raised in the centre; and in two or three years after the shoots are laid down, the whole is closely covered with a mixture of leaves and flowers, thereby producing a most beautiful and interesting display. Sometimes only one sort is planted, and the moss rose is the most suitable for this purpose. A whole bed may, by careful management, be covered by one plant. To have a succession of roses, cut off in May the tops of that spring's shoots. New shoots will come forth, and be in flower in autumn. The moss rose is often thus treated.

We have already alluded to the emblems in which the rose has been employed by fancy; and, as the subject is naturally delightful, we shall add a few other circumstances and facts connected with this flower. A rose in a glass of water, has had this motto, "I live, but in tears." Thomson speaks of spring as being "veil'd in a shower of shadowing roses." But to pass over the endless allusions made by the poets to such a splendid and fragrant plant, we shall find that many historical incidents are connected with it. Marc Antony, when dying, desired Cleopatra to scatter perfumes over his grave, and to cover it with roses. The isle of Rhodes derives its name from its fruitfulness in roses. We need not do more than refer to the War of the Roses in England. Instead of table-cloths, the ancients covered their tables with rose leaves. In feudal times, the lord of the manor often made levies on roses, for providing him with rose water. And at christenings it was once the custom to carry vases filled with such fragrant water. But some have a dislike to roses. Every thing in excess is pernicious. Persons have been known to faint at the sight of this beautiful flower. Its smell has overcome others. The antipathy of a beetle to roses has been maintained to be extreme, and the smell as mortal. "Under the rose," means a secret, and the origin of the sentence is said to be this:—The god of love made a present to Harpocrates, the god of silence, of a beautiful rose, the first that had been known, to engage him not to discover the secret intrigues of his mother Venus. Hence, it became a custom to have a rose placed in their rooms of mirth and entertainment: so that to be *sub rosa*, denotes as much as to be out of danger of having any conversation divulged.

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## ON THE GATHERING AND PRESERVING OF FRUITS.

It is usual to gather fruits in the middle of the day, for then neither the dew of the morning nor the damp of the evening is on the trees. Immature fruit shrivels in keeping, and loses flavour. But to speak of individual kinds of fruit:—early apples begin to be useful for the kitchen in the end of June, and in July for the dessert table. Many kinds ripen in succession afterwards, the winter apples remaining on the trees till in danger of frost. It is a safe rule to observe when they begin to fall naturally, when judging of their ripeness. Another method is, to raise the apple level with the foot stalk; if ripe, it will at once give way; or a specimen may be cut up, and if the seeds be neither blackish nor brown, the apple is not ripe. The same rules may nearly be applied to pears. All the berries in a bunch of grapes do not arrive at maturity at the same time; when the principal part is ripe, the bunch will of course recommend itself to the gatherer, and the decayed or unripe berries may be cut off, before being presented at table. The most transparent grapes are the ripest. Plums come easily from the twigs when ripe. The small end of figs is of the same colour with the large, when they are ripe; and apricots are to be judged of from the softness of the side next the sun. They will over-ripen, if allowed. Every sort of fruit must be injured by rough handling, but plums, and still more, apricots, suffer in their bloom, if not gently treated. Peaches and nectarines, however, require still more care. They should be received into a cup or funnel lined with some soft material, such as velvet, and if ripe, will fall, if moved upwards, and allowed to come down with a slight jerk. A ladder is used, when trees cannot otherwise be reached, but it must not rest on the branches, so as to injure them.

Miller's method of keeping pears is, after sweating and wiping them, so as not to bruise the fruit, to pack them in close baskets, having some wheat-straw in the bottom and around the sides, and a lining of soft paper to hinder the musty flavour of the straw from infecting the fruit. Only one kind of fruit is put into each basket. A covering of paper and straw is added, and a dry room selected, secure against frost, and the less air the better. The basket must not be opened till the contents are wanted; each kind is indicated by a label.

Some have a number of earthern-ware jars, and with a quantity of dry moss placed in layers alternately with the pears, the vessel, when thus filled, is plugged and sealed with rosin. The jars are then sunk in dry sand to the depth of a foot, a dry cellar being preferred to a fruit-room. Others use glazed jars, with covers, and place pure pit-sand, thoroughly dried on a flue, as the alternate layers. The jars are kept in a dry airy situation, cool, and secure from frost. When the fruit is wanted, it is placed previously on the shelves of the fruit-room. Others again, in their earthern jars, wrap each fruit in paper, and use bran as layers.

A Mr. Ingram, in Scotland, found two apartments requisite for winter pears, a colder and a warmer, but free from damp; from the colder the fruit was brought into the warmer, where by means of increased temperature, maturation is promoted. The drawers that receive the fruit are made of hard wood, and their contents frequently examined, in order to give air, and to wipe away any moisture which may have gathered.

Winter apples are laid in heaps, and covered with mats or straw, and lie for a fortnight or so, to sweat. After being

wiped with a woollen cloth, and placed in the fruit-room, they are laid singly on the shelves and covered with paper. Occasional turnings are required, and the removal of such as begin to decay, keeping each sort separately. When apples or pears are kept in hampers, thick paper is considered better for lining and covering than straw, and straw better than hay.

Some altogether disapprove of sweating fruit, and say it should be carried at once to the shelves in the fruit-room, wiping it afterwards when necessary, but using the stove merely to take off the damp of the room.

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## ON BRITISH POISONOUS PLANTS.

We are not attempting any thing like a medical dissertation, but to observe one or two facts connected with the poisonous plants of this country. Vegetable poisons have very varied influences on the human frame; the most frequent, however, act on the nervous system, producing faintness, delirium, madness, stupor, and apoplexy, inducing the loss of the faculties of the mind and of the body, and often ending in death. There is still a great deficiency in our knowledge of poisonous vegetables, either as to the precise virulence of individual plants, or the number of such dangerous productions of our soil. The progress which Botany and Chemistry are making, will, of course, correct gradually this defect. It is, however, a fact we should observe with gratitude, that in our country, these dangerous vegetables are neither numerous in their wild nor cultivated state. Besides, as has been well observed by Salisbury on this subject, the most virulent of them carry with them their own antidote, from the nausea and sickness, and disagreeable taste that belong to them. All these particulars show, in the next place, that an emetic is the best remedy that the medical practitioner can use. But there is still another provision which nature has placed within our reach most abundantly, to counteract the power of vegetable poisons. We refer to a plant which is very common in all watery places, and from experience proved to be one of the most active drugs that can be used, as a remedy; viz. the ranunculus flammula, or water-spearwood.

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## VAN DIEMAN'S LAND.

Van Dieman's Land, or Tasmania, which was discovered by Tasman in 1642, visited by Cook in 1793, and the colony established in 1803, is situated between 40 deg. 44 min. and 43 deg. 39 min. south latitude, and 144 deg. 38 min. and 148 deg. 24 min. of east longitude. Its extreme length is 191 geographical miles, and greatest breadth 171. From its general resemblance to New Holland, one would be induced to believe it a continuation of the latter; nor in travelling through it will the distinction be found very great, although the distance between Sidney and Hobart Town is 560 miles. Considering the extent of Van Dieman's Land compared with the other, it is, if possible, even more mountainous; for look which way one will, the country appears to rise irregularly into a confused jumble of wild and woody hills, a few only forming ranges. Between these are valleys, some of tolerable width, but more extremely narrow, and entirely enclosed by mountains. The plains are the only exception, and they are of great extent, those at Campbell Town exceeding 12,000 acres, and almost without trees.

Vegetation is equally rapid in this colony as in Australia, and the trees often attain a large size: not far from Hobart Town there is an eucalyptus nearly sixty feet in girth; it is quite hollow, with every prospect of flourishing for years to come. The trees are ungainly, shoot up with vast stems, and scarcely any branches; but where the cherry, mimosas, and one or two other ornamental trees are seen, they take off greatly from the effect caused by the uncouth appearance of the eucalyptus tribe. It is from one of this tribe that the manna is procured; it is found on the ground in pieces, none of which are larger than a small bean, and more usually they do not exceed the size of a pea; it often happens that they are still more minute. The manna is white, tastes like sweetened flour, or rather like some kinds of sugar-plum. Some writers say it dissolves immediately the sun is up, which is a mistake, for it may be gathered in both colonies at any time of the day, in clear or in cloudy weather: the greatest quantity collected at one time is generally after a smart shower of short duration. It does not exude from the stem, but from the concretions on the leaves and smaller branches, and is found in such trifling quantities that it would never repay the trouble of collecting it.

The stringy-bark seems to be the most valuable tree in the colony, and there are several kinds of gum nearly equal to it; the woods most esteemed by cabinet-makers are, the Huon pine, black and silver mimosas, a species of cedar, and sassafras.

The trees are all evergreens, with that sombre, olive hue which prevails in New Holland, without a single lively tint, except that of the native cherry, to break the monotony it causes.

There are some very handsome shrubs, and many beautiful flowers; but in this respect it is quite inferior to the other colony.

All the European trees thrive wonderfully well, and sometimes increase. It may well be said, that no climate can be more congenial to the growth of fruits than that of this island; and one great advantage it possesses over Australia is, that instead of ripening at once, as in the latter (tropical fruits are not included), they do so gradually, and, in consequence, a plentiful supply may be had during many weeks. No tropical fruit of any kind will grow, it is said, in Van Dieman's Land.

Geraniums grow in all the unexplored parts of the island in the open air, and frequently attain the height of eight or ten feet; a small slip of the common red one will become a considerable shrub in less than two years.

All the English grasses succeed well, as do the various kinds of grain; the wheat especially is considered of an excellent quality, weighing generally from sixty-two to sixty-four pounds the bushel. Barley and oats will thrive only in good soil.

Apples, peaches, and plums grow with such rapidity, that the shoots sometimes attain the length of six or seven feet (not unfrequently more) in one season; and there are young pears above six feet high, that have been produced from a *pip* put into the ground twenty-two months before. Tobacco will grow well enough; it is, however, very little attended to, only enough being cultivated for the dressing of sheep.

The modes of clearing land are various; some persons cut down and burn off every tree at once, without waiting until they are dead, and without leaving even a few, under the shade of which the cattle might shelter themselves from the intense heat of a mid-day sun: the stumps are left to decay, and the land is cultivated between them. Others employ a plan very commonly practised in America; that is, a deep incision is made quite round the tree (called girdling), which soon dies; and as it then becomes quite dry, it is, when felled, consumed with great facility.

There is another method, which is said to answer well; it is as follows:—A hole, about six inches in diameter, is made in that side of a tree against which the wind is blowing at the time; on fire being applied it communicates with the heart (which must be in a state of decay), involves the whole stem, which is soon destroyed, and any branches or fragments that are left are then heaped together and also burnt! such *is said* to be the case; but it certainly does not follow, as a matter of course, that the stem will be entirely consumed; for thousands of trees may be seen in the forests only partially destroyed, some of them still throwing out branches, and hundreds of them being hollow trunks, perfectly black, and imparting a

most repulsive solemnity to the scenery; yet these trees have been more than once enveloped by the flames of the destructive conflagrations which so often occur.

When the stumps are left to rot they remain a great many years, for if not charred by the fires when burning off, they will occupy a considerable space of time before they become quite decayed. One advantage resulting from girdling the trees, and leaving them standing until ready for the axe, is, that the use of the land is not lost in the meantime, as it can be employed in grazing; but, when the ground is strewed with fallen trees, which are frequently cut down and then left for years before they are burnt off, horses and cattle are liable to be staked or otherwise injured.

When the stumps have not been eradicated, they constantly throw out shoots; these become trees, four or five of which are often the scions of a common parent, and all of them probably many inches in diameter; but if girdling has been adopted this is not likely to occur, the roots, and therefore the stumps, perishing with the stem. As these young forests increase, so must the ground from time to time be cleared: a work of much trouble, for they are often very dense; consequently, it appears reasonable to think it would be preferable to employ either the American method, or to clear the land entirely, as it is wanted.

The expense of clearing land varies according to the description of forest upon it, and to the district in which it is situated; but, although the wages of free labourers are apparently exorbitant, yet, when it is taken into consideration that (if at a distance from a town) they are under the necessity of procuring every necessary they require from the proprietor of the estate on which they are employed, who commonly charges thrice as much for an article as it costs himself (a previous agreement is made respecting this point), their wages are not nearly so high as might be imagined.

If the soil is heavily timbered, as, for instance, in some parts of Illawarra, where there are trees ten feet in diameter, to fell one of which would occupy a man an entire day; the charge, it is said, is sometimes 12*l.* per acre; for this sum the ground will be brought into a state fit for cultivation. It is, however, very rarely that so much is paid, and only where the soil is concealed by an impervious "vine brush," the more usual charge being from 2*l.* to 5*l.*; but this naturally depends upon circumstances. The charge for going over land with a hoe, in order to collect in heaps all the rubbish, fragments of roots, &c., is 12*s.* per acre.

## SCENES IN PORTUGAL.

We have been delighted so highly with some sketches of scenery in Mr. Beckford's late volume, commemorative of his visit to two monasteries in Portugal, in the course of June, 1794, that we are anxious our readers should participate in the same delight, for in the conviction that they will so do, there is a store of additional pleasure for us. To be sure the date is far back to which the sketches immediately refer, but Nature, whether rude or cultured, must ever preserve the same great features, whatever may be the period in which they have been studied and described. It is true, also, that Mr. Beckford's work is neither one of scientific nor practical botany; but since it gives, in several passages, the most faithful, living, and delightful descriptions of the results of botanical knowledge, we consider that these passages will with every reader convey a relish for the department, of a superior kind, awakening or refreshing the happiest fancies and purest tastes that the mind can experience in studying the botanical kingdom. Take a scene in the domain belonging to the monks of St. Vincent.

"After breakfast we walked amongst well-cultivated vegetables, fields of Indian wheat as healthy and vigorous as any that ever flourished in the islands which float about like rafts on the Lake of Mexico, and the most extensive orchards of orange, apricots, and other fruit trees, perhaps in Portugal. Every inch of ground within this enclosure is turned to the most advantageous account: the oranges alone produce from seven to eight thousand cruzados a year. A very active lay-brother has the management of this fortunate spot, and is continually extending its limits over the bare hills in the neighbourhood, many of which are comprised within the domain of the fathers.

"The river Trancao, which runs through the garden, is diminished to a brook at this season; but that brook is clear, and flows rapidly. Its rocky edges, worn into irregular shapes by winter torrents, bloom with the rose-coloured flowers of the oleander. Their appearance was strikingly beautiful—many of these shrubs had attained the height of fifteen or sixteen feet.

"But one of the grandest objects of the vegetable world which ever met my sight, is a bay-tree, situated in the thickest part of the orange orchards, above which it towers majestically, clothed with luxuriant boughs that glisten with health and vigour. It consists of about thirty stems, none less than two feet, and some thirty-eight inches in diameter, springing from one root, and rising to the height of sixty-four feet. I loitered away the sultry hours of mid-day most pleasantly under its deep, fragrant shade."

The very atmosphere, he says, was here loaded with perfume, which universally invested the umbrageous region. In addition to the party, which usually belonged to the same place, he met a certain padre, who had not long returned from China, nay, from Pekin itself, with whom the author held a conversation, in which the following picture of gardening was given:—

"During his residence at Macao, he had learnt sufficient English from one of the padres of our Canton factory—the chaplain, I suppose—to read Sir William Chambers' most florid essay on Chinese gardening. I asked him how many words of truth there might happen to be in all this luxuriant description? He answered, not in plain English, but in a most delectable jargon, half Chinese sing-song, half lingua franca—'There be ten-tousand-time-ten-tousand.'

"'You don't mean to assure me,' said I, 'that our famous architect's most wonderful account of the magical splendour of Yven-ming-Yven and Tchang-tchung-Yven is not exaggerated?'

"'It is not,' answered the padre in sound Portuguese, having quitted the straits and shallows of very scanty English for the full flow of his vernacular language: 'I have seen greater wonders than he—I have seen in the depth of winter a whole extent of garden warmed by a deliciously mild and scented vapour, and all the trees covered with silken leaves and artificial flowers, and, on a pool of water, as clear and transparent as the sky it reflected, hundreds of gaily-enamelled ducks, formed of metal, swimming by mechanism, and by mechanism opening all their bills and uttering their accustomed sound with their usual volubility, and swallowing the food the eunuchs of the palace cast to them—ay, and returning it again, to all appearance most happily digested, the Emperor standing by all the while, laughing at my surprise, and believing himself neither more nor less, I am entirely convinced, than an incarnation of the god Fo!'"

As the author and his hosts, the Grand Prior of Avis, and the Prior of St. Vincent's, proceeded to visit their several domains, a variety of gorgeous scenes fall to be described. In their approch to Carregado, "scenes of boundless plenty began to expand themselves; unlimited fields of Turkish corn, fine barley, and black Sicilian wheat, the ears bending to the ground with their weight;" and of the mansion at Cadafaiz—"The wide latticed windows of the apartment allotted to me commanded the view of a boundless vineyard in full luxuriant leaf, divided by long broad tracts of thyme and camomile,

admirably well kept and nicely weeded, From this immense sea of green leaves rose a number of plum, pear, orange, and apricot trees; the latter procured by the monks directly from Damascus, and bearing, as I can testify, that most delicious fruit of its kind called 'eggs of the sun' by the Persians;—even insects and worms seem to respect it, for no trace could I discover of their having preyed on its smooth glowing rind and surrounding foliage.

"Beyond these truly Hesperian orchards, very lofty hills swell into the most picturesque forms, varied by ledges of rock, and completely inclose this calm retirement; wild healthful spots of delicate herbage, which the goats and sheep, whose bells I heard tinkling in the distance, are scarcely more partial to than myself."

We behold the scene here described as distinctly as if it were painted on canvass, and yet the sketch is hasty and short. For an enchanting description of the artificial style of gardening, the following can hardly be surpassed, whether we consider the subject or the description:—

"As far as the eye could stretch, extended a close bower of evergreens, myrtle, bay, and ilex, not to mention the humble box, lofty, broad, and fragrant; on either side, arches of verdure most sprucely clipped, opened into large square plats of rare and curious flowers; and in the midst of each of these trim parterres, a fountain inclosed within a richly-gilded cage, containing birds of every variety of size, song, and plumage; parroquets with pretty little flesh-coloured beaks, and parrots of the largest species, looking arch and cunning, as they kept cracking and grinding walnuts and filberts between their bills as black as ebony.

"In one of these enclosures I noticed an immense circular basin of varicgated marble, surrounded by a gilt metal balustrade, on which were most solemnly perched a conclave of araras and cockatoos. Their united screechings and screamings upon my approach gave the alarm to a multitude of smaller birds, which issued forth in such clouds from every leaf and spray of these vaulted walls of verdure, that I ran off as if I had committed sacrilege, or feared being transformed by art-magic into a biped completely rigged out with beak, claws, and feathers.

"The strange green light which faintly pervaded the closely-bowered alleys—the aromatic odour universally diffused—the rustle of wings, the chirping and twittering above my head and on every side of me, was so completely bewildering and magical, that I almost doubted whether ever again I should be permitted to emerge into common life or common daylight. The soft, perfumed, voluptuous atmosphere of this seemingly enchanted garden, induced a languor and listlessness to creep over me I scarcely ever felt before."

## R. B. STEWART'S OUTLINES OF BOTANY, &c.

We did not expect, on reading the title-page of this little volume, that it would be of much value. "Outlines of Botany; a Sketch of the Linnæan Arrangement of Plants, with Tables to illustrate Distinctions of Genera and Species; to which are added, Hints for the Management of a small Garden," besides observations on a Hortus Siccus, or Book of Specimens, &c. some attempts in verse, descriptive of a real scene, and in defence of botany—seemed to promise too much to be good for any thing. But we can assure our readers, that we have been most agrecably disappointed, and that the book is excellent. The author has a true and strong feeling of the beauties of botany and gardening, and the art of communicating to others his enthusiasm. His directions and arrangements are also simple and to the point, so that a better little manual cannot often be found for young beginners, either in the science or the practice of horticulture. We recommend the observations on gardening, especially to people who have small gardens in the town or city. The introduction to these observations, and the chapter on the hortus siccus, we shall here quote.

"In forming a flower garden, the principal considerations are to secure,

First, a good aspect;
Secondly, a situation near to the house or mansion;
Third, good soil.

"Draining must be attended to, or the best soil will not ensure success.

"A very common error in planning and laying out small gardens is the want of unison in the different parts; trees and shrubs are planted without any view to the effect of the whole; the flower beds are so shaped and disposed that any of them may be changed in form or taken away, without rendering the general effect either better or worse; and the walks wind through the chaos without any apparent object but caprice: thus the garden possesses no other beauty than that derived from the separate forms of the plants which it may contain.

"The flower borders should be arranged in flowing lines, and for every turn in the walks there should be some object in view, such as to avoid the obstruction of a group of shrubs, or to discover some new beauty hitherto unseen.

"The particular shape of the ground must of course depend upon the owner's taste. I shall merely observe further, that I consider the usual manner of laying out town gardens any thing but good. I would propose to vary the walk, so as to give it a more interesting character; and would keep in view some general plan, to which every detail should be subservient and conducive.

"A little rock-work would have an excellent effect, and might be composed of flints, and of bricks run together in the kiln, which last are technically called burs. Trees and tall-growing plants should be placed at the top, small flowers and creepers at the bottom of the rock-work, or it will have neither beauty nor effect.

"The soil in a town garden becomes in a year or two completely saturated with soot. This evil is in a great measure without remedy; but something may be done by procuring a little fresh earth and laying it on the old soil. Fresh loam from a common is the best for this purpose.

"Gravel must be annually renewed, or it will have a very sombre appearance. There is no better gravel than that of Kensington; I have heard of gentlemen having it carried by sea to their gardens in Wales, and the north of Scotland.

"Manure will be found very requisite, for without it the ground cannot well support the growth of dahlias and other strong herbaceous plants for two years in succession. I should recommend that a very small quantity of lime be laid on the ground one year, and thoroughly decomposed stable manure about two inches deep the next year. November is a good season for laying the manure on the ground; and it should be dug in and thoroughly mixed with the earth to a considerable depth, when the borders are trenched in March.

### "*Hortus Siccus.*

"In the study of botany, it will be found very advantageous to prepare a book or folio of dried specimens of plants. Such a book is called Hortus Siccus, a dry garden. Select from the plant a flourishing and vigorous piece, bearing leaf, flower, bud, and, if possible, seed; lay it upon thick blossom blotting paper, with one or two sheets of the same over it, upon which, unless the plant be very thick and succulent, lay another specimen, and then more paper; be careful to lay each leaf and flower smooth and flat upon the paper; let no part of the specimen be under another part; cut off, with a sharp knife, any leaf that cannot be disposed of without touching or crossing another, and, if any bud or flower be too thick to lie properly, cut off the under part, taking care to leave the stamens and pistils. In the case of any plant particularly full of sap, a hot iron may be passed two or three times over the covering sheet of paper.

"When the specimens and paper are arranged, place a heavy

weight upon them; after a few hours, gently shift the position of each specimen to a dry part of the paper, and replace the weight: repeat this, changing the paper if necessary, until the specimens be perfectly dried; then prepare a solution of gum, with a little camphor in it, and secure each specimen to a page in a folio of cartridge or whity-brown paper. A little practice will enable the learner to do all this with ease and expertness.

"Next, write under each specimen the name of the class and order to which it belongs, its genus and species, whether it be a tree, shrub, or herb, and the country of which it is a native."

## A DEFENCE OF BOTANY.

Let him who will, sweet Botany despise—
Let him who will, neglect to use his eyes—
Let him who will, in human error see
The dire effects of Adam's fatal tree.
Let me no longer view the struggling race,
But all creation's fairest beauties trace;
And first, O ——, thy defiance meet,
And bring thee, as I hope, to Flora's feet.
You ask me, Wherefore man should spend his hours,
Should "waste his time," 'mid senseless plants and flowers?
Can it be wrong that system well to know,
Where all we see, perfection still can show?
Can it be wrong to read in every sod
The surest evidence that there's a God?
Can it be wrong that study to attend,
To which thy wisdom, Solomon, could bend?
No! to the first, plain common sense replies;
No! to the next, alarm'd Religion cries;—
Alarm'd, lest, scorning things of lowly birth,
Ye learn to scorn the hand that made the earth.
No! to the third, hear Science loud declare—
Nor to despise what ye know nought of dare.
Deep thought, my friend, thy arguments may show;
More free than mine thy polish'd verse may flow;
With well-pick'd words, with ev'ry sentence fit
T' adorn thy cause, and decorate thy wit:
Religion, Science, Reason, are my aid,
And vain 'gainst Botany is thy tirade.
Thus far, sweet Flora, do I plead thy cause—
Thus far extol the study of thy laws;
Unmatch'd in charms, fair nature's glorious boast,
The truest eulogy will praise thee most.

## DESCRIPTION OF THE PLATES.

### GESNERIA ELONGATA.

ELONGATED GESNERIA.

Didynamia Angiospermia.—Linn.

Gesneriæ.

Stem tetragonal, hairy. Leaves opposite, stalked, oblong, acuminate, acute at base; younger ones crenate, tomentose beneath, purplish. Peduncles axillary, pilose, four-flowered, elongated. Flowers in umbels, upon erect pedicels. Calyx five-parted; segments ovate, acute, equal. Corolla tubular, ventricose, scarlet, pubescent externally; the lobes rounded; stamens inserted at the base of the corolla; filaments smooth; anthers ovate, two-celled; stigma two-lobed. Capsule ovate-conical, pilose. Seed minute.

This elegant stove plant is a native of the kingdom of Quito, South America, and thrives well in a light, rich soil. It may be increased readily by cuttings, which root freely either in sand or mould, under a hand-glass, in heat.

### CALYPSO BOREALE.

NORTHERN CALYPSO.

Gynandria Diandria.—Linn.

Orchideæ.

Root a small tuber which sends out a few yellowish fibres at the base. Leaf solitary. Petiole very pale green, dilated at the base, and confluent with the tuber. Lamina yellowish-green, somewhat egg-shaped, more or less chequered with dull purple spots (Gmelin observed some without any spots whatever). Peduncle from three to six inches high, pale whitish-green tinged with dull red. Bracteas, three or four, semi-transparent, tinged with dull red. Pericarpium obconical, very finely hairy. Petals, five, whitish purple, narrowly lanceolate wedge-shaped, the two lowest somewhat falcated. Labellum darker than the other petals, especially internally, where it is beautifully variegated with zebra stripes, which appear through its whole substance, dependent, shaped like a poke or sack, and terminating behind in a double spur, bent back round the orifice, the lower part of which as well as much of its internal surface is bearded with yellow glandular hairs. Style dull purple, bordered by a whitish broad membrane, near the top under the anther, ending in a retuse or two-lobed flap which hides the stigma. Anther yellow, inserted in the hollow part of the style above the flap, but below the margin, almost round, easily detached, consisting of two cells, each again divided, and four valves. Pollen in four solid masses, and adhering at a very early period to the two blunt lobes of the flap.

This rare and curious plant is a native of Lapland, Russia, Siberia, and Nova Scotia, flowering early in May; and is preserved in gardens with great difficulty. It must be planted in a loamy soil, and in a situation to have the morning sun only. Propagated by parting the roots, but it must be done with caution.

### ALETRIS CAPENSIS.

WAVED-LEAVED ALETRIS.

Hexandria Monogynia.—Linn.

Bulb tunicated, of a violet colour. Root-leaves six, spotted with violet. Spike or raceme terminating, imbricated with great abundance of flowers on very short peduncles. The bracte to each setaceous. Corolla subcylindrical, with flesh-coloured dots, and a very short obtuse border; the filaments adhere to it as far as the very edge. The germ is shut up in the bottom of the corolla. Style incurvated. Stigma obtuse. Capsule a little inflated, acutely keeled, compressed at the corners, and large.

It is a native of the Cape of Good Hope; flowers from November to April. So ornamental a plant would probably be more common, were it more easily propagated; but it neither readily perfects its seeds, nor is it easily increased by its roots.

Miller directs the bulbs to be planted in pots lined with light earth, that they may be sheltered in October and through the winter, and in a dry, airy glass case, and sparingly watered till May, when they may be placed abroad in a sheltered situation, and may be frequently watered in warm weather.

### ANTHOLYZA MERIANELLA.

DWARF ANTHOLYZA.

Triandria Monogynia.—Linn.

Irideæ.

Root bulbous, culm polished, columnar, a foot and a half high. Leaves alternate, sheathing, sword-shaped. Corolla

Gesneria elongata.

Calypso boreale.

Aletris Capensis.

Antholyza Merianella.

salver-shaped; tube bent, purplish, larger than the border, which is six-parted and equal; the divisions ovate, acutish yellow. Stamens rising, the length of the corolla. Anther linear, incumbent. Style, filiform. Stigmas three, filiform.

This very rare species is perfectly distinct from the *Meriana*, is of more humble growth, and producing from four to six flowers, which are proportionably longer, more closed, and of a deeper red colour than those of *Meriana*.

Native of the Cape of Good Hope. Flowers in May and June. Is readily increased by offsets, and requires the same treatment as the Cape bulbs. Succeeds best when planted in light sandy bog earth.

## CITRUS LIMONUM SYLVATICUM.

WILD LEMON.

Polyadelphia Polyandria.—LINN.

Aurantiaceæ.

The wild lemon is a beautiful evergreen, attaining, in warm countries, the height of twenty feet or more, but in our hothouses seldom exceeding the size of a large shrub. The stem is numerously branched and furnished with long angular spines. The leaves are stiff, like those of the laurel; alternate, for the most part oval-oblong, pointed, of a bright green colour, and without an appendage to the foot-stalk. The flowers are numerous, of a beautiful white within; pale violet red without. The fruit is small, oval, straw-coloured, and terminating with a nipple-like protuberance at the end. The rind is thin and fragrant; the pulp is of a whitish yellow colour, divided into eight or ten cells, containing a very agreeable acid juice. The seeds are numerous, oval oblong, and yellow.

This variety is seldom cultivated, on account of the thickness and number of the spines with which it is armed.

The fruit is very good, and its juice, which is much more acid than that of the orange, possesses similar virtues. It is always preferred where a strong vegetable acid is required. Saturated with the fixed vegetable alkali, it forms the citrate of potassa, which is in frequent extemporaneous use in febrile diseases, and by promoting the secretions, especially that of the skin, proves of considerable service in abating the violence of fever. This medicine is also often employed to restrain vomiting. As an anti-scorbutic, lemon juice has often been taken on board ships destined for long voyages; but even when well depurated of its mucilaginous parts, it is found to spoil by long keeping. To preserve it in purity for a considerable length of time, it is necessary that it should be brought to a highly concentrated state, and for this purpose it has been recommended to expose the juice to a degree of cold sufficient to congeal the aqueous and mucilaginous parts. After a crust of ice is formed, the juice is poured into another vessel; and, by repeating this process several times, the remaining juice, it is said, has been concentrated to eight times its original strength, and kept without suffering any material change for several years. Whytt found the juice of lemon to allay hysterical palpitations of the heart, after various other medicines had been experienced ineffectual; and this juice, or that of oranges, taken to the quantity of four or six ounces in a day, has sometimes been found a remedy in the jaundice. The exterior rind of the lemon is a very grateful aromatic bitter, not so hot as orange peel, and yielding in distillation a less quantity of oil, which is extremely light, almost colourless, and generally brought from the southern parts of Europe, under the name of Essence of Lemons. The lemon-peel, though less warm, is similar in its qualities to that of the orange, and is employed with the same intentions. The pharmacopœias direct a syrup of the juice *syrupus limonis*, and the peel enters into some vinous and aqueous bitter infusions; it is also ordered to be candied; and the essential oil is an ingredient in some formulæ. Properly diluted with water, and rendered palatable by the addition of sugar, it forms *lemonade*, which is, perhaps, the most agreeable and refreshing beverage that can be employed to quench thirst and diminish heat in febrile and inflammatory disease.

## CITRUS AURANTIUM.—SINENSE.

CHINA ORANGE.

Polyadelphia Polyandria.—LINN.

Aurantiaceæ.

The orange is a middle-sized tree, with the stem covered by a smooth greenish brown bark. The branches are short and irregular. The younger ones are angular, and of a pale greenish yellow. Leaves oval-oblong, of a shining light green, and furnished with long winged petioles. Flowers, white. The fruit is a globular berry, of a reddish yellow colour externally, and internally divided into ten cells, filled with a mucilaginous pulp, each containing from two to four cartilaginous seeds.

It is a native of China, and rarely produces good fruit in England.

The China orange contains a large quantity of saccharine matter and mucilage, united to an agreeable acid; hence it is much employed as a wholesome, cooling, and antiseptic article of food for the sick.

The orangeries in this country are supplied, either by plants raised from the seed, and budded, inarched, or grafted by our gardeners, or by small budded trees imported in chests from Italy.

The orange is supposed to have been introduced into Italy in the fourteenth century, above a thousand years after the citron. In England, these trees have been cultivated since 1629. Parkinson, writing at that time, says, "The orange hath abiden with some extraordinary looking and tending, when neither citron nor lemon trees could be preserved any length of time." The orange trees he alludes to were those of Beddington, in Surrey, introduced from Italy by a knight of the noble family of the Carews (Gibson's edit. of Camb. Brit.), and the first that were brought into England; they were planted in the open ground and placed under a moveable cover during the winter months. It has been said that these trees were raised by Sir Francis Carew, from seeds brought to England by Sir Walter Raleigh; but, as such trees would not have readily borne fruit, Professor Martyn thinks it much more likely that they were plants brought from Italy. Bradley says, they always bore fruit in great plenty and perfection; that they grew on the outside of a wall, not nailed against it, but at full liberty to spread; they were fourteen feet high, the girt of the stem twenty-nine inches, and the spreading of the branches one way nine feet, and twelve feet another. These trees, Evelyn informs us, were neglected in his time, during the minority of their owner, and finally entirely killed by the great frost in 1739-40; they were planted before 1595.

During the latter end of the seventeenth and beginning of the eighteenth centuries, the orange tree was a very fashionable article of growth in conservatories, when there were but few exotics of other sorts kept there. The plants were procured from Genoa, with stems generally from four to six feet in height; they were planted in large boxes, and were set out during summer to decorate the walks near the house, in the manner still practised at Versailles and the Thuilleries. About the middle of the eighteenth century, when a taste for botany and forcing exotic fruits became general, that for superb orange trees began to decline; many of these large trees have decayed through neglect; and those which are now to be found in the greater number of green-houses, are generally dwarf plants bearing few fruit, and those of small size. In some places, however, are still to be found large and flourishing trees. Those at Smorgony, in Glamorganshire, are the largest in Britain; they are planted in the floor of an immense conservatory, and bear abundantly. It is said that the plants were procured from a wreck on the coast in that quarter, in the time of Henry VII.

At Nuneham, near Oxford, are some fine old trees, planted

under a moveable case, sheltered by a north wall. In summer the case is removed, and the ground turfed over, so that the whole resembles a native orange grove. At Wormleybury, Hertfordshire, and Shipley Hall, in Derbyshire, are very fine large orange and lemon trees grown in borders and in boxes. (Hort. Trans. vol. ii, 295, and iv, 306).

At the Wilderness, Kent, are three trees in boxes, not surpassed by any trees so grown in Europe.

At Woodhall, near Hamilton, trees of all the species of citrus are trained against the back-walls of forcing houses, in the manner of peaches, and produce large crops of fruit.

In the south of Devonshire, and particularly at Saltcombe, one of the warmest spots in England, may be seen in a few gardens, orange trees that have withstood the winter in the open air upwards of a hundred years. The fruit is as large and fine as any from Portugal. Trees raised from seed, and inoculated on the spot, are found to bear the cold better than trees imported.

All the species of citrus endure the open air at Nice, Genoa, and Naples; but at Florence and Milan, and often at Rome, they require protection during the winter, and are generally placed in conservatories and sheds. The largest conservatory in Italy is that of Prince Antonio Borghese, at Rome, which contains seventy select sorts of agrumi. The largest trees are at Sorenta. Terracina, Gaeta, and Naples; but the most regular and garden-like culture of the orange is in the orange-orchards at Nervi, Monaco, and other places in the neighbourhood of Genoa. At Nervi are also the orange nurseries which may be said to supply all Europe with trees; they are, in general, wretchedly cultivated, and the stocks inoculated in the most unscientific manner; but the fine climate, strong clayey soil, and abundant manurings, supply in a great degree the nicer practices of gardening. There the names of varieties vary as much as those of gooseberries do in England; but from upwards of 180 names, not above 40 distinct sorts can be procured. Good plants of the Maltese and other varieties of orange may be procured from Malta; and some sorts also from Lisbon. From the nurseries at Paris about thirty sorts may be obtained—much smaller plants than those from the other places named, but more scientifically grafted or inoculated. The catalogues of London nurserymen enumerate above thirty varieties of oranges, twelve of lemons, and several varieties of the other species; the plants are partly Genoese, partly French, and partly propagated here.

## CLAYTENIA SPATULÆFOLIA.

SPATULA-LEAVED CLAYTONIA.

Pentandria Monogynia.—Linn.

Portulaceæ.

Root about the size of a Spanish nut, dull brown, sending out short fibres from various parts near to the top. Leaves few, radical ones attenuated into petioles, which, as well as the stem, run under ground for a short space, from one to two inches long, spatulate, quite entire, obtuse, smooth, succulent; stem, where broken, perforated by a tough string. Flowers in a simple circinnate spike. Anthers bright purple, deeply divided both at top and bottom. Seeds impregnated by a central chord continuous with the style, generally six in number.

This curious plant is a native of North America, in Carolina, and produces its pink or rose-coloured flowers from March to May. It grows best in a border of peat soil, and is readily increased by seeds.

## CINERARIA CRUENTA.

PURPLE-LEAVED CINERARIA.

Syngenesia Superfluas.—Linn.

Compositæ.

Stem herbaceous, rising to the height of two or even three feet, furnished with cordate angular leaves, purple underneath; petioles eared at the base. The summits of the branches are covered with a profusion of purple flowers, some of which begin to expand in January, and are followed by others in succession through the whole of the summer; by candle-light they exhibit an extraordinary degree of brilliancy.

Of the many ornamental green-house plants introduced by Mr. Masson, this is one of the most desirable; as a showy plant, it has indeed few equals.

It is a native of the Canary Isles, and is propagated by parting its roots, and, during summer, requires a greater degree of moisture than many other plants.

## DAPHNE MEZERIUM.

MEZEREON.

Octandria Monogynia.—Linn.

Thymaleæ.

It has a strong root, which gives off a number of small, tender fibres, covered with a smooth olive-coloured bark. The stem is bushy, with nearly upright alternate branches, covered with a smooth, grey bark, and seldom growing above four or five feet high. The leaves are deciduous, lanceolate, scattered, smooth, stalked, about two inches long, and half an inch broad, appearing after the flowers, and accompanied by flower buds for the next season. The flowers are disposed in clusters about three together, on the naked branches; they are of a pale rose colour, fragrant, sessile, monopetalous; tubular, with the lip divided into four-deep ovate, spreading segments. The fruit is a pulpy, scarlet berry, containing a single seed.

Mezereon is a low shrub, which occurs wild in some parts of England, and produces its flowers in February and March; in mild seasons, in January.

The whole of this vegetable is extremely acrid, especially when fresh; and the berries, when swallowed, prove a powerful poison, not only to man but to many quadrupeds. They are, however, the favourite food of some species of finch.

## ASARUM EUROPÆUM.

EUROPEAN ASARABACA.

Decandria Monogynia.—Linn.

Asarinæ.

The root is creeping, fleshy, and fibrous. The stem is very short, seldom exceeding an inch; is simple, round, pubescent, bearing a single flower and a pair of leaves only, which spring almost immediately from the root. The leaves are opposite, kidney-shaped, smooth, dark green, shining, and stand upon long downy footstalks. The flower is solitary, rather large, drooping, of an herbaceous colour externally, and dusky purple within, standing upon a short peduncle at the base of the leaf-stalks. The calyx supplies the place of a corolla; it is large, bell-shaped, coriaceous, and divided at the mouth into three rather deep, pointed segments, which are turned inwards. The stamens are twelve, about half the length of the calyx, and produced beyond the anthers into a little hook. The style is simple, crowned with a stigma divided into six radiated recurved segments. The capsule is coriaceous, six-celled, crowned with the substance of the calyx, and containing many ovate seeds.

It is a perennial plant, a native of England, and other parts of Europe, but extremely local in this country, being confined chiefly to a few places only in the northern countries.

The leaves of this plant are extremely acrid, and are occasionally used, when powdered, as a sternutory. A few grains snuffed up the nose, for several evenings, produce a pretty large watery discharge, which continues for several days together, by which head-ache, tooth-ache, ophthalmia, and some paralytic and soporific complaints have been effectually relieved.

Claytenia spatulafolia.

Cineraria Cruenta.

Daphne Mezerium.

Asarum Europaum.

Pl. 26.

*Gleanings in Natural History.* Third and last Series. By Edward Jesse, Esq., Surveyor of His Majesty's Parks, Palaces, &c. London: Murray. 1835.

In the third volume of these Gleanings, which has but lately appeared, we find a rich and varied collection of facts, observations, and anecdotes, that not merely have a direct and powerful tendency to win the reader over to the study of natural history, but to mend the heart. Mr. Jesse finely expresses himself, when he informs us, that he is never so happy as when strolling on the banks of some clear and beautiful stream in a clear day; the scenery, the birds, and flowers, all add to his pleasure. He is, therefore, apt to dwell on such charms whence so much of his happiness is derived. But the mere act of living in the country is not enough; there must be a taste for its spirit, and a habit for cultivating an acquaintance with its phenomena; nay, the study of nature, even when confined immediately to the science of botany, should lead to what may be called the interpretation of the language of plants, and thence upwards to the knowledge of man and his Creator. Our author says—

"I was pleased at an observation made to me lately by a nurseryman. He said that he thought it impossible that any one could entertain atheistical notions, who studied the nature of plants, and observed the different uses for which they were designed by a benevolent Creator, according to the nature of the different climates in which they are found. He shewed me the pitcher-plant, which flourishes only in very hot countries. Its tube is about as long again as the bowl of a tobacco-pipe, and is filled with an aqueous fluid. This supplies water for birds, and is admirably adapted for the purpose. The cactus tribe grow in hot sands, and afford both food and water, and we generally find that according to the wants of man and animals in different countries, food best adapted for their use is bountifully supplied.

"There is an extreme sensibility in the tendrils of vines, and they afford another proof how admirably Nature has adapted every thing to fulfil the purpose for which she designed it. Without this extreme sensibility of the tendrils, the vine would fall to the ground, and its fruit would not ripen. As the shoot grows, the tendrils are thrown out, and at the end of each there is a little hook. As soon as this fastens upon any thing, the tendril twists itself about it, turning round and round, till it has completely contracted itself. The moisture which occasioned its flexibility then recedes, and it becomes hard. Its tenacity is then so great that it requires some effort to disengage it. The two first tendrils, which the branch or shoot of a vine throws out, are, I observe, much stronger than the subsequent ones.

"I watched, this summer, the shoot of a vine which came across one of the windows of my house. At first only two strong tendrils appeared. The second came in contact with the glass, and though it had nothing on which it could lay hold, its mere friction against the glass occasioned it to distort itself till it became like a piece of knotted twine. The other tendril had nothing which it could touch, but I observed that it altered its position every day, turning itself about, as if seeking for an opportunity of fulfilling the use for which it was designed. If I held a stick against it for a short time, it was evidently affected by it, and this was seen by a change in its previous position.

"These details may appear trifling, but I cannot consider them as such. They are facts and circumstances in the economy of Nature, which prove that nothing was made by chance, or for ends not 'admirable.'

"Vines which are not trimmed till March, bleed much, and will continue to do so until the leaf is fully expanded. It is remarkable that although this is the case while the trees are leafless, yet lop them as much as you please when the foliage is out, and they will not shed one drop. Dr. Hales was not acquainted with this circumstance when he cut off a large bough from his vine late in the spring, and it was fortunate for science that he was not. His solicitude for his vine, and his various attempts to stop the effusion of sap, led him, step by step, to many expedients, which by degrees brought on abundance of curious experiments, and ended in that learned publication known by the name of *Vegetable Statics*. This work has done much honour to its author, and has been translated into many modern languages."

Our readers will at once perceive the talent and tenderness with which Mr. Jesse can mingle natural history and moral sentiment into the same details; and, therefore, we can run no risk of fatiguing them with his observations. Nor does he diverge from the character of his work, neither do we, from that of ours, when the agricultural peasantry becomes the theme of his sympathies and instructions. Accordingly, we gladly admit into our pages the following considerate and valuable statement.

"The welfare of the agricultural peasantry is one of those subjects which will always interest a naturalist. It is, indeed, intimately connected with almost everything which makes the country delightful to me, and enhances the pleasure of my rural walks. To be greeted with smiling, happy faces; to see the inside of cottages clean and orderly, the outside decorated with flowers, and well-cultivated, flourishing gardens, never fail to produce sensations of pleasure and satisfaction. If, in addition to this, I find a thriving pig in a sty, I know that the family is doing well, and that the head of it is a hard-working, industrious man. Happily, some such cottages may still be seen in almost every village in England; affording to the neighbourhood a useful and instructive example of the benefits to be derived from sobriety and industry.

"I think that I am well acquainted with the habits and characters of the peasantry of this country. I lose no opportunity of gaining information respecting them from the best sources, and I see all who call upon me either for relief or work; there are not a few of the latter, as my official situation has fortunately afforded me the opportunity of giving employment to many. I wish I could add that the result of these inquiries was a satisfactory one; but it is a fearful truth, that both the moral and the physical condition of our peasantry is getting worse and worse. And what is the cause of this? Is it from want of employment? I have seldom found an instance of a steady, hard-working man, of sober, industrious, and honest habits, who could not get work, and who was not fairly paid for it. It is not from over taxation and the dearness of the necessaries of life, because nine shillings a week will go further to maintain a family now, than twelve shillings a week would a few years ago. But haunts of vice, and facilities for drunkenness, have been multiplied to a frightful degree in every town and village in England. Those, also, whose examples should check the vices, and improve the moral condition of the poorer classes, are, on the contrary, poisoning the sources from which their own wealth, their power, and even their subsistence are derived. Whenever the tie which unites the rich and poor is broken, the consequences must be formidable. And is it not on the point of being separated? Is it made closer by good example, by abstaining from those vices which are condemned in the poorer classes, and by constant endeavours to improve their moral condition? As long as this is not the case, let us not expect too much from the labourer. He will generally follow the example of his more prosperous neighbour, whether for good or bad, and will find an excuse for his own profligacy, or neglect of what is right, accordingly.

"In those villages where attention has been paid to the morals and well-being of the labourers, the most beneficial results may be seen. The beer-shops are less frequented, the poor-rates are low, the church is well attended, and the labourers have but little to complain of; indeed, they appear happy and flourishing: a proof of this may be seen in a village with which I am well acquainted. Owing to the exertions, in the first instance, of one individual, poverty has

been almost excluded from the place; every one looks happy and contented, and the village itself is a picture of neatness and prosperity. The church has been repaired and enlarged, school-rooms have been built, and various improvements made in the village, and all by voluntary subscriptions, some of them by persons not even residing in the parish, but who were desirous of aiding the exertions of the individual referred to. I should add, that endeavours are making to do away with the necessity of church-rates, an example which I should be glad to see followed in other places.

"An adjoining parish offers an example of the effects of bad management. The tradesmen meet on parish business at an ale-house in the evening, many of them generally half drunk. They are headed by an attorney, who has involved the parish in law suits, and driven every respectable person from the vestry-meetings. The poor-rates are enormous, the church-rates high in proportion, and the parish is overwhelmed with debts and unemployed poor."

He says truly, that the value of English soil will always be in proportion to the prosperity of the English peasantry, and that, therefore, were the middle and higher circles of society aware of this, they would perhaps interest themselves more than they have done in behalf of the agricultural labourer.

"I know some estates, the rental of which is eat up by poor-rates, and the poor, notwithstanding, are in a wretched condition. By allotting portions of these badly cultivated and unprofitable estates to the unemployed labourers, much might have been done towards improving their condition, and, consequently, in reducing the poor-rates. A labourer who has a moderate-sized garden and orchard attached to his cottage, will, with very little assistance, generally contrive to feed himself and his family, and be able to keep a pig; indeed, I know from actual observation that this is the case. I lately went over a district in Berkshire, where each cottage had its garden and orchard, and it was a real pleasure to me to witness the comfort and prosperity of the owners of them. Under an Act of Parliament for enclosing the waste lands of the district I have referred to, an allotment in severalty was attached to each cottage, which could not be alienated, and the good effects may now be seen. In fact, if a peasant is placed in a situation which will make him depend for a certain portion of his subsistence on the produce of land which he cultivates, he will very rarely apply for relief from the poor rates.

"It is much to be regretted that this was not the case under each of the enclosure acts which the legislature have passed. The interests of the poor, as well as those of the rich, as has since been lamentably proved, would then have been properly attended to. I consider, however, that the enclosure acts generally have been the greatest curse which could have been heaped upon the poor; and I quite agree with an able writer, because I know it to be a fact, that in almost every instance, the increase of poor-rates has kept pace visibly with the progress of inclosures.

"How well do I recollect going with my excellent mother, when I was a boy, to visit some cottages on the edge of an extensive common near her residence. The owner of each of them had his flock of geese and other poultry, a few sheep, and now and then a cow; and a donkey to convey the eggs, poultry, fruit and vegetables to a neighbouring market. The garden was studded with fruit-trees, bee-hives, and flowers, and the inside of the cottage was a picture of neatness and happiness. Well do I recollect, also, the little grateful offering of some honey-comb, or a few of the best apples, in return for some attention to a sick child, or other kindness shown to them by my mother. One worthy couple had two sons and five daughters, all of whom were well brought up, and all did well in the world; and, at their death, the old people contrived to leave 120*l.* to be divided amongst their children. The husband was a day labourer, and I am persuaded that not only he, but any of his poor neighbours, would have thought it as great a disgrace to have accepted relief from the poor-rates, as to have been sent to jail. The common has now been enclosed some years, and all the prosperity of the cottagers has disappeared. It is a melancholy sight, and may, without going further, be attributed to the enclosure of a common from which the labourers derived so much of their means of subsistence. People have been in the habit of decrying the advantages which the poor derived from the exercise of their common-rights; but it has been well observed, that, to him who has, and who fortunately wants but little, a trifle is of importance; this *trifle* amounted probably to half the subsistence of the man's family. Whenever labour was slack, he had always something in reserve, upon which he could profitably employ himself."

Hoping that it is not yet too late to better the condition of our peasantry, we will leave it to others, or at least not adopt this Magazine as the vehicle of any opinion upon the precise means of attaining that most desirable object. The economy of trees suggests the following poetic and interesting ideas:—

"When I see a magnificent old tree standing beside a clear, broad, and unruffled river, I can fancy that it delights in contemplating its own grandeur in the watery mirror. The space which intervenes between the tree and the river is generally covered in spring with a great variety of flowers, as if nature's liberal hand delighted in decking the giant's favourite spot with garlands of every hue. Unlike the cypress—

> A gloomy tree, which looks as if it mourn'd
> O'er what it shadows,'———

the sight of a fine oak always gives me the idea of something grand and majestic, and it seems to impart a kindly influence to everything around it. The economy of trees, plants, and vegetables, is a curious subject of inquiry, and in all of them we may trace the hand of a beneficent Creator; the same care which he has bestowed upon his creatures, is extended to plants; this is remarkably the case with respect to hollies: the edges of the leaves are provided with strong, sharp spines, as high up as they are within the reach of cattle; above that height, the leaves are generally smooth, the protecting spines being no longer necessary. Mr. Southey has noticed this circumstance in the following pretty lines:—

> 'O reader! hast thou ever stood to see
> The holly tree?
> The eye that contemplates it well perceives
> Its glossy leaves;
> Order'd by an Intelligence so wise
> As might confound an atheist's sophistries.
>
> Below a circling fence, its leaves are seen
> Wrinkled and keen;
> No grazing cattle through their prickly round
> Can reach to wound;
> But, as they grow where nothing is to fear,
> Smooth and unarm'd the pointless leaves appear.'

"I was lately shewn a plant which puts out a pretty, modest flower, from the lower part of the stem. When its blossom is over, the stalk on which it grew turns down to the ground, the end penetrates the earth, and there throws out and ripens its seed-pod; but for this propensity of the plant, the seeds would probably be destroyed by birds and insects. Some plants flourish in one climate, and others in another, according to the several purposes for which they were designed by a good Providence. Some which are generally useful will bear almost any temperature. This is particularly the case with grass. Nettles, I believe, are never touched by cattle of any description, neither will they trample upon them. What a secure retreat, therefore, do they afford for birds to build their nests amongst, and for hares to deposit their young amidst the shelter they afford! The same remark applies in a great degree to furze, thistles, and the common bramble.

"The extraordinary fact of trees and plants springing up

in various places where they had not formerly existed, is confirmed by Mr. M'Gregor, in his valuable and interesting work on British America. He says that white clover springs spontaneously wherever the lands are cleared of the woods. He then adds, that it is an extraordinary circumstance in natural history, that wherever the original forest is destroyed in America, and the land left uncultivated, trees of a different species should spring up. This is always observed where lands have been laid waste by fire. The first year, tall weeds and raspberry and bramble bushes shoot up; then cherry trees, white birch, silver firs, and white poplars appear, but seldom any tree of the genus previously growing on the space laid open by fire. Sir Alexander Mackenzie also observes, that the banks of the Slave Lake, formerly covered wholly with spruce fir, and birch, having been laid waste by fire, they produced subsequently nothing but poplars.

"A few years ago, a house was built in Newcastle-on-Tyne, and the earth which was dug out of the foundation, was thrown on a piece of ground in the front, intended for a garden. The following spring a number of caper-plants came up; they were not common in that part of the country, and their appearance, therefore, created a good deal of surprise. Upon inquiry, it was found that some years before, this ground had been a public garden; it therefore appeared certain that these seeds had remained dormant whilst buried deep in the earth, and had sprung to life as soon as they were brought within the influence of heat and light.

"These facts are sufficient to prove that seeds do not lose their vitality through a long period of time."

Did Mr. Jesse, in these and such like observations and anecdotes, do no more than beget in his readers a love for the study of nature, as discovered in the vegetable kingdom, he would be entitled to high praise for his contributions to knowledge, and his lessons of piety. But it is the animal kingdom which chiefly engages him in the present volume, where, of course, there is a higher scope for the inculcation of moral truths and sentiments, and where all will feel their principles of kindness and sensibility enlisted in behalf of the inferior animals, in a way most virtuous and satisfactory.

## STEWART ON THE MANAGEMENT OF A SMALL GARDEN.

In our number for last month, we took a very favourable notice of Mr. Stewart's small work, which contains the hints that we are about to extract for the benefit of our town-readers. The author, not without sufficient grounds, pleases himself with the thought that his performance, however small and unpretending it may be, may fall into the hands of persons of ability residing in towns, and who might otherwise never have turned their attention to the subject; and that therefore it may also lead to experiments and observations which may astonish even the favoured horticulturists of the country. Taking the same view of his work, and entertaining an equal anxiety to benefits of such pleasant and plain instruction as he conveys, we gladly avail ourselves of some of the directions and hints which he has found in practice to be good.

In reference to trees in the dense atmosphere of a town—all must be aware that they do not thrive so well there, as in the country; there are yet some kinds that are more suitable than others for such a situation.

Mr. Stewart properly recommends that they should be planted when nearly of the desired size, since their growth will not be rapid. The plane is but slightly affected by soot; the cherry thrives better than the apple, but very few evergreens prosper in London. The list of trees that he recommends includes the acacia, apple, birch, common ditto, weeping, cherry, mulberry, plane, sycamore, and willow. As to shrubs, we have the following list, and directions:

"Aucuba japonica; Black currant; Chimonanthus fragans; China rose; Colutea arborescens; Fig; Guelder rose; Hawthorn; Ivy; Jasmine, white; Laburnum; Lilac, common; Ditto, Persian; Privet; Rose Acacia; Sumach; Sutherlandia frutescens; Vine; Virginian creeper.

"The ivy, though evergreen, thrives better than could be expected, especially after it has been established for some years in the ground. Aucuba japonica also thrives tolerably well. The laburnum blooms freely; I have seen it trained to cover a wall, for which purpose it seems very fit; it will likewise form a pretty shrub, or even a tree.

"The black currant actually bears fruit in London, and is but little affected by the smoke.

"I have placed the China rose among shrubs, though in London it partakes of the herbaceous character, frequently dying down to within a few inches of the ground in winter.

"The sumach is not much affected by the smoke, and on this account, as well as for its very great beauty, should have a place in every town garden.

"The fig does well trained against a south wall.

"The lilac and jasmine thrive and flower well; the former in spring, the latter in autumn.

"All shrubs require a little judicious pruning after the leaf is fallen, which it would be well to get an experienced hand to do. Hoeing and raking in spring and summer are very beneficial.

"The Virginian creeper and the vine, are by far the best climbing plants for a town garden. Wherever a wall is to be covered, nothing can be better for the purpose.

"If the vine be properly pruned, it will bear tolerable grapes in the open air, when the season is not unusually severe. The pruner should observe that the fruit is always produced upon the shoots of the same year's growth, and that it is not the old wood which yields grapes: the vine should be pruned as soon as the leaves are fallen off: the branches which are to produce the bearing shoots for the following year, should be shortened so as to leave not more than seven or eight eyes or buds, and of these, the three or four which appear the weakest should afterwards be rubbed off or picked out with the point of a sharp knife; otherwise the vine would become exhausted, and yield but poor small fruit: the shoots just above the seventh or eighth eye are to be cut, and the cutting to be sloped in such a manner that the water discharging from the shoot may not run on the upper bud to injure it. About the beginning of May, the vine should be looked over, and any shoots from the old wood rubbed off; if any eye produce two shoots, the weaker should be removed. Vines require to be frequently examined after this time, to rub off any irregular shoots. About the latter end of June, the extreme points of the bearing branches are to be nipped off with the finger and thumb, this will cause them to produce side shoots; and, in a month afterwards, those side shoots or laterals should be treated in the same manner. It is found that by painting black the wall against which the vine is placed, the fruit will ripen much better and earlier than it otherwise would; it is also advantageous to nail the bunches close to the wall. When the grapes have attained nearly their full size and begin to assume their colour, a bag of coarse black gauze should be drawn over each bunch, and loosely tied round the stalk.

"No garden should be without the elegant and beautiful guelder rose,

> "'throwing up into the darkest gloom
> Of neighbouring cypress, or more sable yew,
> Her silver globes, light as the foamy surf
> That the wind severs from the broken wave.'"

Of the smaller shrubs and herbaceous plants he gives a much more extended list, which must be sought for from his own pages. The observations that are connected with this list, however, justly claim a space in our Magazine.

"April is the season for planting any or all of these in a town garden: the sorts named are not the less beautiful for being generally known, but there is no doubt that many others might be added, of equal beauty and greater rarity.

"The leaf of Monarda didyma is very fragrant; that of the Chinese chrysanthemum is beautiful, but the flowers being produced late in autumn, are frequently injured by frost.

"The splendid appearance of Delphinium grandiflorum must attract the eye of every lover of plants.

"Many of the culinary herbs, especially balm and thyme, deserve a place on account of their fragrance; they generally do well in a town garden during the summer months; the same may be said of the wall-flower and southern-wood.

"Veronica spicata should on no account be omitted.

"The daisy forms a most beautiful edging to borders or rockwork, but it seldom survives the winter.

"London pride is most appropriately named; as an edging, or for crevices in rockwork, it is matchless. The leaf suffers in winter, but it opens into beautiful foilage and flower in spring. The same may be said of the globe flower.

"If a small glazed frame or hand glass be admitted into our litttle garden, the roots of Marvel of Peru should be potted and placed in it early in March; and turned into the open border in May. The plants must be taken up in October, root, top and all, and be preserved from frost and damp; a dry room is an excellent place to keep them in: the old tops should only be cut off when the roots are potted in the spring; if raised from seed under a hand glass in March, it will bloom the same year.

"Ground ivy, periwinkle, lysimachia, and meadowsweet, the latter especially, are very suitable plants for a town; rockwork cannot be complete without them. Monkshood is equally desirable.

"It is needless to expatiate on the beauty of pinks, carnations, the globe flower, purple iris, œnothera biennis, and gentianella.

"The fox-glove and scabious appear to most advantage when planted among trees and shrubs; their straggling growth and wild luxuriance produce in such a situation an effect somewhat approaching to that of natural underwood; and to imitate all that is agreeable in nature should be the endeavour of every gardener who would wish to obtain either pleasure or profit from his labour."

As the Dahlia is the king of plants for a town-garden, and thrives well there, we quote our author's rules regarding its cultivation.

"Pot the roots in March, and, if a frame be used, place the pots in it; but the bloom will be equally good, though not nearly so early, if they be left in the open air. When the plants are about six inches or a foot high, and have many stems, take off several suckers from the root in the following manner:—Place the fore finger between the sucker and the main stem, press down the finger into the earth until you feel the root, and then push off the sucker, which will generally have a small portion of fibre attached to it. Not more than two or three stems should ever be left on the old root, unless it be intended for any particular situation where a very bushy plant is required. The old roots may now be turned into the open border, and the suckers should be carefully potted, two or three in each pot, and placed in the frame thus left vacant for their reception; or if there be another frame ready, so much the better, as the old roots may then remain under shelter until the end of May.

"Air should at all times be given to the frames from eleven o'clock in the morning, until three o'clock in the afternoon, when the plants should be very moderately watered, or rather sprinkled, and the frame shut. I ought here to observe, that before the plant appears above the earth in the pot, no water whatever should be given, as the root is full of sap for the nourishment of the bud, and water may cause it to decay and canker. When the young plant appears, water may be given, but with a very sparing hand until the dahlia be six inches high. The light of the frame must gradually be opened wider and wider as the season advances, so as to harden the plants, and, by degrees accustom them to the open air, before they are removed from the shelter of the frame.

"The young suckers may be turned into the open border late in June, or in July, and will generally bloom the same year. Roots are considered preferable when only one year old, as blooming then more freely than afterwards. I confess I have doubts as to the truth of this; for I think that almost every thing depends on the soil and treatment which the root receives, and not on whether it be young or old.

"When dahlias are required in a mass, or large group, the taller plants should be at the back, those not quite so tall should come next, and so on to the front of the group, where the smallest must be placed. If the bed be intended to be viewed from opposite points, the tallest plant should be in the middle; by this means, the flowers of each plant will be seen to advantage, and each will enjoy its due portion of air and light.

"With a view to such arrangements, many nurserymen and others profess to state precisely the height to which each individual variety of dahlia will grow; I am, however, confident that the practice and observation of those who cultivate dahlias will confirm my opinion, that it is impossible to state correctly the height at which any particular sort will arrive. Undoubtedly there are many sorts which may properly be called *dwarf;* but of two plants of the same variety, one will very frequently be much taller than the other. A dwarf single flowering dahlia, which grew in a garden of which I had the principal management, was never known in any year before 1830, to exceed the height of 2½ feet. The root was potted, with many others, and placed in a frame early in March, 1830. It grew so strongly and so soon, that on the 5th April, while some of the others were not above ground, and none of them two inches high, I took five very fine suckers, full six inches long, off the dwarf, leaving only the tallest stem, which was about seven inches high. This stem now grew with great rapidity, increasing its thickness in due proportion to its height. Many fresh suckers appeared, but these I constantly took off. In the same frame, and under precisely the same arrangement, I had some of the tallest known varieties of the dahlia.

"On the 10th June, the dwarf was five feet high, and had one flower fully opened, and many buds; while the tallest plant of the tallest variety in the garden was not three feet high. I had taken off the suckers as fast as they appeared on either plant, and treated the one in precisely the same manner as the other. I mention this circumstance, to prove the impossibility of stating the precise height of varieties of the dahlia.

"The variety of foliage in a group of dahlias is incredible. The leaves of many sorts have a character almost as peculiar as the flower.

"Where only the tall varieties are cultivated, it is well to know that any sort may be dwarfed (if I may use the expression), by keeping it in a pot; the pot may be plunged in the ground, so that the dahlia will appear exactly as if planted. This mode of treatment, by checking exuberant growth, will be found very advantageous with many sorts that do not otherwise bloom freely; and will likewise incline many sorts to bloom earlier than they would if turned into the open border.

"Dahlias may, of course, be raised from seed. March is the season for sowing: directions for this operation will be found under the head 'Annuals.' When the young plants are about 1½ inch high, they should either be pricked out in boxes, at four inches distance from each other, or put three in a pot. When they crowd each other, they may be turned into the open border, and treated just the same as the old plants and suckers. I would strongly deprecate sowing London or town-grown seed: it is hardly ever good. Indeed, in a small garden, all flowers should be cut off at the bottom of the footstalk as soon as the petals fade: this will add greatly to the neat appearance of the garden, and cause all plants to bloom much more freely.

"In October or early in November, all dahlias should be taken up; a dry day, a dry week, if possible, should be select-

ed for this purpose. The roots should be cleaned from earth, and, *when perfectly dry*, placed in some room where frost and damp cannot penetrate. *No part of the stalks must be cut off.* Inattention to this rule will be followed by frequent disappointment. The top should be cut off only when the root is potted in spring.

"The dahlia root should be potted in a mixture of three-fourths sand to one-fourth mould. The sand is requisite to preserve the root from decaying, which it sometimes is apt to do, before the fibres shoot and the young plant appears.

"There are infinite varieties of the dahlia, growing to different sizes, and blooming at from one foot to fifteen feet high.

"My opinion of the importance of the dahlia to a town gardener is the reason for my noticing it at this length. With dahlias, heartsease, and mignonette, a very pretty garden may be made, though no other flowers be admitted to it.

"N. B. In some gardens, it is the practice to leave the roots of dahlias in the open ground through the winter; but this is hazardous, unless the situation be more than commonly dry."

Equally simple and appropriate remarks follow a list of the annuals, the bulbous roots, and the greenhouse plants. We shall however confine our last extract to those general observations which he throws out for the benefit of the amateur gardener.

"In purchasing plants in pots, they should be examined as to their roots: if the roots appear on every side of the ball when turned out of the pot, and hold the earth well together, the plant will do well; but if the earth be loose, and the roots not grown to the shape of the pot, then you may be sure the plant has just been pulled out of the open ground, and will soon die: always look at the root of every plant you buy, whether in pots or otherwise.

"Herbaceous plants should be procured in April, for they will do better if they enlarge their flower-buds where they are to bloom, than if planted when just opening into flower.

"I need hardly say that stove or hothouse plants do not thrive in the open air. I prefer buying small plants to large ones, as I like to see them grow; but this is a mere matter of opinion or taste.

"The amateur gardener would do well to receive, from some experienced person, an introductory lesson in digging, raking, hoeing, sowing seeds, planting, potting, and pruning: seeing the operations performed is better than reading directions alone.

"A water engine, with different nozzles, would be of great service, to wash off the soot from the plants.

"Slugs and snails are enemies alike to town and country gardens; the only way to get rid of them is to catch them by hand; a few cabbage leaves laid on the borders will facilitate their capture, as they will adhere to the under sides of the leaves; the most speedy, and therefore the most humane method of killing them, is to throw them into very hot water.

"If there be any grass in a town garden, it should be annually renewed, or it will be far from ornamental during eight months of the year.

"The more constant the attention paid to any garden, the better will be its appearance. No plant should be suffered to bear seed in a town garden: when the corolla decays, or falls, the whole of the flower-stalk should be cut off; by this means many plants which flower in spring and summer may be kept in full bloom till October; allowing even one seed-vessel to ripen, may prevent a plant from blooming again, which would otherwise have been attractive for months longer.

"Be very careful to take off all decayed leaves; one withered leaf, if left on a plant, frequently causes the withering of several more. The attention required by plants in a town garden leads to a very minute and particular knowledge of their physiology, habits, and actions: this last word may occasion surprise, but it is certain that plants have action and motion, as well as animals. I do not allude in particular to such plants as mimosa sensitiva and dionœa muscipula; but motion may be observed in the convolvulus, ploughman's weatherglass, and many other common species."

## CAMBRIDGESHIRE.

This is one of the inland counties of England, and is bounded on the north by Lincolnshire, on the north-west by Northamptonshire, on the west by Huntingdonshire, on the south-west by Bedfordshire and Hertfordshire, on the south by Essex, on the south-east by Suffolk, and on the north-east by Norfolk. The form of the county bears some resemblance to that of the human ear, Huntingdonshire cutting deeply into its western side by a circular projection. It contains 686 square miles, and (as Mr. Vancouver reported to the Board of Agriculture, in 1794) 443,300 acres. Of these he calculated there were 132,000 open field, and 150,000 waste and unimproved fen; but since that time both these descriptions of land have been very considerably reduced by inclosure and cultivation. The northern part consists chiefly of what is called the Isle of Ely, which is a separate district, possessing a jurisdiction of its own. Including this, the county contains seventeen hundreds, one city, one sea-port, nine market towns, one hundred and fifty-seven parishes, and, as every one knows, a university. Its nearest parish is about forty miles north of London.

The surface of Cambridgeshire presents considerable variety. The northern part, including the Isle of Ely, is chiefly fen land and perfectly level, intersected with numerous canals and ditches, and abounding with windmills for the purpose of carrying the water from the lands. It is naturally a boggy district, comprising nearly one of the tracts called the Bedford Level, the whole extent of which is 400,000 acres. This vast level is divided into the north level, the middle level, and the south level—the largest portion of the middle level, and a considerable part of the south level, being in Cambridgeshire. The principal of the drains by which this immense district has been in a great measure rendered either rich meadow or arable land, are the Bedford Old and New Rivers, which are navigable in a straight line upwards of twenty miles across the county, from the Great to the Little Ouse. Those parts of the county which lie adjacent to Suffolk, Essex, and Hertfordshire, have their surface varied by gentle hills and downs. The south and south-western part, which is watered by the Cam, is the most fertile and agreeable. The district in the south-east, which extends from the Gogmagog hills, about four miles to the east of Cambridge, to the town of Newmarket, is bleak and thinly inhabited. This division is connected with that immense tract of land which stretches into Essex, Suffolk, and Norfolk, and forms one of the most extensive downs in England.

There is a very considerable variety of soil in Cambridgeshire. The substrata are chalk, clunck (an impure limestone), gravel, gault (a stiff blue clay), sand, silt (a fine sea sand), and peat earth. In the cultivation of these different soils, oil cake, dust, pigeons' dung, decayed woollen rags, soot, &c., are employed as auxiliaries to the common manures. The soot is generally laid on in spring, at the rate of twenty bushels an acre, for the purpose of driving away the wire worms which infest the heavy and light soils.

The chief rivers in this county are the Ouse, and Granta or Cam. The Ouse rises in Northamptonshire, and after watering Buckinghamshire and Bedfordshire, it enters Cambridgeshire between Fenny Drayton and Erith, from which it runs eastward through the fens, till at some distance above Denny Abbey it turns to the north, and passing Streatham, Ely, and Littleport, it crosses the north-western part of Norfolk, and flows into the sea at Lynn Regis. The Cam has three branches, the principal of which rise at Ashwell in Hertfordshire, and enters Cambridgeshire to the west of Gilden Morden. After flowing to the north-east, receiving several rivulets, it is enlarged near Grantchester by the united waters of some streams

from Essex. After this junction, it takes a northerly course, flows through the walks of the chief colleges in Cambridge, and falls into the Ouse at Harrimere, in the parish of Streatham.

Besides these rivers, there are numerous canals, principally for the purpose of draining the land. There is also the Cambridgeshire canal, which commences in the Ouse at Harrimere, and terminates at Cambridge. A cut of three miles extends to Reche, and another of three and a half miles to Burwell; and the Wisbeach canal, which joins the Wisbeach river at the old sluice in the town, opening a communication with Norfolk, Suffolk, and other places. When speaking of canals and marshy lands, we may observe that in the midst of them the towns and villages, built upon the elevated grounds, rise like islands from the sea, and may be distinguished at the distance of many miles.

The great level, which, as mentioned above, extends to 400,000 acres, appears to have been formerly firm and dry land. Great quantities, both of the trunks and the roots of fir and oak trees, and of furze and nut bushes, standing in the solid earth, have been found at various depths in the fens; and it appears from the description of the Fenny country, given by Henry of Huntingdon, who lived in the time of King Stephen, and of William of Malmsbury, that it was covered with fine wood, and was a flourishing district. A few centuries afterwards, however, the fens were covered with water, and reduced to the condition of a morass; the health of the inhabitants was destroyed by the exhalations from the stagnant waters; the county was rendered impassable even to boats, from the sedge, reeds, and slime, with which it was covered, and the inhabitants were exposed to famine. As early as the reign of Edward I., attempts were made to drain such extentive marshes, which in after times have been continued with various success.

This county is not celebrated for its agriculture. There seems to have been a confirmed degree of unskilfulness and want of enterprise amongst the Cambridgeshire farmers, indicative of the most stubborn attachment to old or prevalent fashions. Unless it be within these few years, there was not one agricultural society in the county; and one cannot but lament that where such varied and exalted education has been for so many centuries established, as in Cambridge, no ray of light, no engine of power, has thence issued to advance the most important and delightful art that man can study. In a county so extensive, and possessing land so valuable and improveable, and of such various qualities, is it not a matter of surprise, that hardly any experiments, or rather new practices, the results of which have been satisfactory, are known to have arisen? Partiality to the ways of their grandfathers seems to have been so deeply rooted in the minds of the generality of the farmers themselves, that they will not soon or easily be prevailed upon to part from it. There has however been an awakening from this bigotry. Enclosures of the open field have taken place to a great extent, and the lands are recovering from the effects of the old impoverishing system that necessarily belonged to the previous uncivilized state of matters as to these lands. One thing however the Cambridgeshire farmers may justly boast of, and this is as graziers; but it is to be regretted that they have not received more rapidly a few arable lessons from their Norfolk neighbours. Wheat is grown, as also barley, and immense crops of oats; but the rotation observed in general, is by no means such as is established in well cultivated and managed districts or counties throughout the United Kingdom. It is said that about one-fourth of the fen lands is cropped with cole, which is principally sown to be eaten green by sheep, very little being now cultivated for the seed. The cultivation of hemp and flax is extensive in that part of the county which borders on Norfolk. In some parts mustard is a valuable and favourite crop; and saffron at one time was another, though, it is believed by us, not now. Sedge is cultivated near Chippingham. The reed was also at one time an extensive produce, but the improvements of the fens must necessarily lessen the abundance of this article. White seed or fen hay is grown abundantly in some places. It increases the milk of cows. Oziers are a profitable crop in certain spots. And so great is the value of turf, that land producing it has been sold at from fifty to eighty pounds sterling per acre.

In the neighbourhood of Elm, Upwell, and Outwell, butter of the finest quality is made; and owing to the peculiar nature of the pasturage in the vicinity of Cottenham, the cheese of that place is remarkable for a flavour particularly delicious. Calves are suckled here for the London market: when speaking of butter, we should have said that it is rolled up in pieces of a yard long, and about two inches in circumference, which is done for the convenience of the colleges, where it is cut into slices, and so sent to table. The cows kept on the dairy farms are mostly of the breed of the county. Immense numbers of sheep are pastured on the heaths and commons, the principal breeds being the Norfolk and West country. The Cambridgeshire farmers consider themselves unrivalled in cart horses, which are of the large black breed. In the fens they are a source of great profit. In this county there is also a singular breed of hogs; some of them fatten to forty stones, fourteen pounds to the stone, at two years old.

At Ely, Soham, Wisbech, &c., are many large gardens, producing so abundantly of vegetables, and common kinds of fruit, as to supply not only the neighbouring towns, but much more distant parts, affording employment for many hands. Great quantities of strawberries are grown in the vicinity of Ely. Orchards are also numerous and large in the same district, the chief growth being apples and cherries; Soham is remarkable for the latter. As to the rent, expenses, produce, and profit of the gardens and orchards of Cambridgeshire, there has been by writers a complaint of a want of information, arising either from inability or unwillingness to lend it on the part of the cultivators. It appears however that the rents have frequently been from three to seven pounds per acre—that the occupiers labour hard themselves—and that a family is generally decently maintained by two or three acres, which proves that the profits are large. The rents of the orchards are much higher than those of the gardens for vegetables and common fruits. Woods are not extensive in Cambridgeshire; but many plantations have been made where there are enclosures.

The estates vary very much, as in almost every other British county, in size; the greatest part however may be said to be in value from 200 to 500 and 1000 pounds sterling per annum. There is much land belonging to colleges and other public bodies. Every kind of tenure is to be found; there are vast numbers of leaseholds, under college and other public bodies, chiefly for twenty-one years, renewable every seven years, paying also an annual rent, called a reserved rent; the usual fee for renewal is from one and a quarter to one and a half year's rent. Some are grants for a number of years, and some for life or lives.

The houses of the proprietors need not be spoken of here, there being nothing particular as regards them, from those found in other counties. But the farm-houses and premises are in general bad, inconvenient, and of such materials as must subject the tenants to heavy expenses in their frequent repairs. Lath and plaster, or clay and wattle, are the most common materials. There are many lately erected premises, most of them defective in arrangement and convenience, and almost all over-barned. The barns are too low on the stud. The cottages of the labouring peasantry can only be expected to be wretched when the houses of the farmers are bad.

The size of farms vary generally from 20 to 100 acres—a few only exceeding 1000; there is a considerable number however, from 100 to 1000 acres. Rents are paid mostly in money, though many, chiefly those belonging to colleges, are paid by corn. It is never an easy matter to give correct information as to the general amount of rent throughout a county. In the agricultural report of Cambridgeshire, published in 1813, we

find it thus stated: enclosed arable land from 15*s.* to 25*s.*; open field 7*s.* to 15*s.*; woodland 12*s.* to 16*s.*; improved fen 10*s.* to 25*s.*; improved pasture from 20*s.* to 30*s.*; inferior pasture 7*s.* to 16*s.*; waste and unimproved fen 1*s.* and 6*d.* to 6*s.* and 6*d.*; sheep walk about the same as the last. From all this it appears that cultivation and enclosing are profitable operations in Cambridgeshire; would not the first style of farming be equally so?

This county is by no means a manufacturing district. At Ely, however, there is a pottery for coarse ware; and here also, as well as in some other quarters, excellent white bricks are made. Lime and chalk are the source of considerable trade and profit. Malt is also made in the north-west of the county. There are several mills for preparing oil from cole and rape-seed. and a pretty extensive paper manufactory. Near Cambridge is held one of the greatest fairs in England; it lasts a fortnight, and is in the month of September.

The climate of Cambridgeshire varies not a little in various parts. In the south-east it is cold and bleak; in the fenny district damp and unhealthy, though much less so than formerly; in the south and south-western parts it is mild and agreeable. The population in 1811 was 101,109; in 1821 it was 121,909: and in 1831 it was no less than 143,955.

## GARDENING OPERATIONS FOR OCTOBER.

The great business of nature, with respect to the vegetable creation, at this season, is dissemination. Plants, having gone through the progressive stages of springing, flowering, and seeding, have at length brought to maturity the rudiments of a future progeny, which are now to be committed to the fostering bosom of the earth. This being done, the parent vegetable, if of the herbaceous kind, either totally dies, or perishes as far as it rose above the ground; if a tree or shrub, it loses all its tender parts which the spring and summer had put forth. Seeds are scattered by the hand of nature in various ways. The winds, which begin to arise at this period of the year, disperse far and wide many seeds, which are curiously furnished with wings for this purpose. Hence plants with such seeds are, of all, the most universally to be met with; as dandelion, groundsel, ragwort, thistles, &c. Other seeds, by the means of hooks, lay hold of passing animals, such as the common burs. Many are contained in berries, which being eaten by birds, the seeds are discharged again uninjured, and grow where they happen to light. Thus carefully has nature provided for the distribution and propagation of plants.

The gloom of the falling year is in some measure enlivened during October especially, by the variety of colours, some lively and beautiful, which the fading leaves of shrubs and trees put on. To those temporary colours are added the more durable ones of ripened berries, a variety of which now enrich our hedges—such as the hip, the fruit of the wild rose, the haw, and the berries of the elder and holly. These are, by the peasantry, believed to be most plentiful when the ensuing winter is to be most severe.

In most of the wine countries of Europe, the vintage takes place in this month; for the grape is one of the latest fruits in ripening. At the close of the month a few flowers still cheer the eye; and there is a second blow of some kinds, particularly the woodbine. But the scent of all these late flowers is comparatively faint.

*Kitchen Garden.*

Plant out some of the lettuces that were raised in August, into a well sheltered border, or into a hot-bed frame, to supply the table during winter or spring. Cauliflowers that were planted out last month from the seed-bed, may now be put under hot-bed frames, at the distance of about four inches from one another, or under hand-glasses. Four or five plants may be planted under each hand glass, all of which, should they survive the winter, may again be put out in the spring, except one or two at most of the strongest, which should be allowed to remain and produce heads. Propagate aromatic vegetables by slips, such as thyme, mint, sage, &c. Asparagus beds should receive their winter dressing, that is, their stalks should be cut down, and the alleys between the beds should be dug, and a little of earth from the alleys spread over the surface of each bed. Asparagus beds require some dung once every two years, which should be applied at this season. Before the alleys are dug, a little well rotted dung should be spread over the surface of the beds, dug in with a fork, and covered with a little of the earth from the alleys. Where forced asparagus is required early in winter, a hot-bed may be made any time this month. Plant some early Mazagan beans, and Hotspur peas about the end of this month, to stand the winter and produce a crop early in summer.

*Fruit Garden.*

Winter pears and apples should, in general, be gathered this month, some being ready at the beginning, others at the middle and end of the month. None of the more delicate eating pears should be allowed to lay longer than the middle date, especially if the nights are frosty. A little frost will cause many of them to rot before they are fit for the table. Let a dry day, as we have more particularly explained in our last number, be chosen, and a period of the day when the fruit is itself dry.

About the end of the month, apricots, peaches, and nectarines may be pruned.

All sorts of fruit trees may be planted now. The ground for this purpose should be trenched to the depth of two spades or so, and should be well manured. If the borders on which the fruit trees are to be planted have not a sufficient depth of soil, a quantity of good earth should be added. Peaches, apricots, nectarines, plums, and cherries, may be advantageously planted, at the distance of about fifteen feet from one another. Pears and apples, when engrafted on dwarf stocks, may be planted about the same distance, but those which are on free stocks about eighteen or twenty. Cherries and plums for standards should be planted at the distance of twenty or twenty-five feet from one another. Apples and pears on free stocks should be thirty or forty feet asunder, and twenty-five or thirty from one another in the row. Dwarf apples and pears, however, may be at less than half that distance.

Gooseberries, currants, and raspberries, may likewise be planted about the end of October.

*Flower Garden and Pleasure Ground.*

Bulbous-rooted plants, such as tulips, hyacinths, &c. may be planted any time in the month, either in beds by themselves, or in flower borders, together with other flowers; but the finer sorts of tulip, hyacinth, ranunculus, and anemone, are commonly put in beds, six or eight inches distant, and two or three deep. Plant out deciduous and evergreen trees and shrubs. The method of doing this is to open a circular hole, wide enough to receive the roots, and about a spade deep, according to the length of the roots. Thorn and other hedges may be planted towards the end of the month, or any time in the course of next.

*Nursery.*

Sow haws, holly berries, hips, barberries, yewberries, acorns, maple, and ash seed, cherry and plum-stones, in a bed about four feet wide. It is a common practice to keep haws and hips in heaps covered over with earth for winter months; for those which are sown without this preparation, frequently lie a year in the seed bed without coming above ground. Plant cuttings of laurels and evergreens.

*Green-house and Hot-house.*

The hardier kinds of green-house plants should all be removed into the green-house, where they should have plenty of air, except in very cold or wet weather.

The succession pine-apple plants should be removed into the fruitery house, which should previously receive a quantity of new tan. The younger succession plants should be moved into the place of those that have been transferred into the fruitery house; air should be freely given in mild weather, and water very moderately.

## HERBARIUM.

It is sometimes called *hortus siccus*, which signifies a dry garden, being an appellation given to a collection of specimens of plants, carefully dried and preserved. The value of such a collection is very evident, since a thousand minutiæ may be preserved in the well dried specimens of plants, which the most accurate engraver would omit. Specimens ought to be collected when dry, and carried home in a tin box. Plants may be dried by pressing in a box of sand, or with a hot smoothing iron. Each of these has its advantages. If pressure be employed, a botanical press may be procured. The press is made of two smooth boards of hard wood, eighteen inches long, twelve broad, and two thick. Screws must be fixed in each corner with nuts. If a press cannot easily be had, books may be employed. Next, some quires of unsized paper must be provided. The specimens, when taken out of the tin box, must be carefully spread on a piece of pasteboard, covered with a single sheet of the paper, quite dry; then three or four sheets of the same paper must be placed above the plant, to imbibe the moisture as it is pressed out. It is then to be put into the press. As many plants as the press will hold may be piled in this manner. At first they ought to be pressed gently. After being so treated for about twenty-four hours, the plants ought to be examined, that any leaves or petals which have been folded may be spread out, and dry sheets of paper laid over them. They may now be replaced in the press, and a greater degree of pressure applied. The press ought to stand near the fire, or in the sunshine. After remaining two days in this situation, they should be again examined, and dry sheets of paper laid over them. The pressure then ought to be considerably increased. After remaining three days longer in the press, the plants may be taken out, and such as are sufficiently dry, may be put in a dry sheet of writing paper. Those which are succulent may require more pressure, and the blotting paper to be again renewed. Plants which dry very quickly, ought to be pressed with considerable force when first put into the press; and if delicate, the blotting paper should be changed every day. When the stem is woody it may be thinned with a knife, and if the flower be thick or globular, as the thistle, one side of it may be cut away, as all that is necessary, in a specimen, is to preserve the character of the class, order, genus, and species. Plants may be dried in a box of sand in a more expeditious manner; and this method preserves the colour of some kinds better. The specimens, after being pressed for ten or twelve hours, must be laid within a sheet of blotting paper. The box should contain an inch deep of fine dry sand, on which the sheet is to be placed, and then covered with sand an inch thick; another sheet may then be deposited in the same manner, and so on, till the box be full. The box must be placed near a fire for two or three days. Then the sand must be carefully removed, and the plants examined. If not sufficiently dried, they may again be replaced in the same manner for a day or two. In drying plants with a hot smoothing iron, they must be placed within several sheets of blotting paper, and ironed till they become sufficiently dry. This method answers best for drying succulent and mucilaginous plants. When properly dried, the specimens should be placed in sheets of writing paper, and may be slightly fastened by making the top and bottom of the stalks pass through a slip of the paper cut for the purpose. The name of the genus and class should be written down, the place where it was found, nature of the soil, and the season of the year. These specimens may be collected into genera, orders, and classes, and titled and preserved in a portfolio or cabinet. The method of preserving many of the cryptogamous plants is more difficult, on account of the greater quantity of moisture which they contain, and the greater delicacy of their texture.

## THE SUN-FLOWER.

The sun-flower *(helianthus)* forms a genus of plants of which there is a number of species, and is so called from the ideal resemblance of the yellow flowers to the sun with his golden rays, rather than to the supposed turning of its flowers towards that luminary. The root is mostly perennial; the stem herbaceous, upright, and often very tall; the leaves opposite or alternate, undivided, often rigid and scabrous; the flowers large and terminal, usually disposed in a corymb. It belongs to the *compositæ*. The species are numerous, and mostly inhabit North America. The gigantic sun-flower *(H. annuus)*, so common in gardens, is said to be a native of Peru. The root is annual; the stem thick, cylindrical, rough, from six to twice the amount of feet in height; the flowers sometimes a foot in diameter, and are so inclined as to take nearly a vertical position, being usually turned towards the south; they have the disk very large, and the rays short in proportion. The seeds form excellent nourishment for poultry and for cage birds; and an edible oil has also been expressed from them. *H. tuberosus* is a native of Brazil, and has been extensively cultivated in Europe for the sake of its tuberous roots, which are used as a substitute for the potato. It is often called Jerusalem artichoke, the first term being a corruption of the Italian word *girasole;* and the latter has been applied to it from the resemblance in the flavour of the roots to that of the common artichoke. Their roots are eaten cooked in various ways, but are not so generally liked as potatoes; neither are they so nourishing or wholesome; they are, however, excellent for sheep and other domestic animals during the winter season. The plant flourishes in every soil, requiring little attention; but in a good soil the roots are larger and of a better quality. When once planted, they may be left for years upon the same ground, as there are always enough of roots remaining for reproduction, after the removal of all that are wanted for the purposes of aliment. The season in which they are dug up for use is from September to November. So extremely productive is this plant, that between seventy and eighty tons of the roots are said to have been obtained in one season from a single acre of ground. This plant grows to the height of eight or nine feet; the flowers are smaller than those of the preceding.

## THE VEGETATION OF HIGH MOUNTAINS.

We give the following abridgment of some observations, by M. Ramond, to be found in the *Annales du Museum*. On ascending the high mountains of France, he says the close observer is immediately struck with the luxuriance of their vegetation. The plants seen in the adjacent plains are changed in size and form; their stems are elevated, their flowers larger, and even the leaves of trees exhibit a size which might lead a person to doubt whether they were of the same species in both situations. The woods are denser, and the herbage closer and greener, from the depths of the valley till the heights are reached, where naked rocks and eternal snows are to be found*. Such superior vigour hastens the periods of their existence in a manner not elsewhere known. There every thing goes on rapidly, for the air is in perpetual agitation, and hence germination, florescence, and fructification, quickly follow one another, every fine day being a spring to some particular class of plants, or to some of the heights where they grow.

Again, if the mountains and valleys be examined, every place has its peculiar soil, every different elevation its peculiar climate, and each its peculiar plants. While therefore in the valleys the same plants occupy large spaces, in the mountains they are continually varying. Now, as for the causes of these separations, elevation above the level of the sea seems the chief. In every 100 inches in height, the temperature falls about half a degree of our thermometers. After that degree of cold which generally stops all vegetation, an eternal frost prevails on the summit of these alps, as at the poles, and every 100 metres of vertical elevation corresponds nearly to one degree of the distance at which the mountain is placed from the pole. By this scale the various phenomena of different climates in our globe may be easily understood, at least in so far as general results are concerned. While the increase of cold is accompanied by a diminution of the column of air, it is also affected by the obliquity of the rays of the sun, and the distribution of plants in alpine countries depends principally on these two causes.

In the Swiss Alps and Pyrenees, trees cease to grow at about 24,000 metres of actual elevation, as they do about the 70th degree of north latitude. There are again lesser bounds which have each their characteristic occupants. At the foot of the mountain is the oak; in the middle the beech; then the fir and yew, and next the pine. The juniper dwells in a still higher altitude, even to the height of 29,000 metres, gradually, however, losing as it ascends, the habit and aspect which distinguish it upon the plains. Annuals are almost entirely driven from the places still higher, but hardly any elevation seems to stop the growth of some perennials, which, during severe cold, shelter themselves under the earth and snow, forming their buds under ground and springing up the first fine day of the succeeding year.

One mystery, however, is to be observed as to the original dissemination of plants; nature seems, by turns, indifferent to the similarity of situation or to the distance between them; sometimes bringing together in the same climate, plants of the most distant countries, and sometimes opposing this agreement of vegetables to regions exactly alike, both in soil and temperature.

The vegetable zone of our Alps has indeed no other limits than those of the soil covering them. The *Pic du Midi*, is 3000 metres above the level of the sea, where the thermometer is not found to rise to the temperate point. Yet on nearly a bare rock many species of plants have there been gathered. On the borders of perpetual snow, plants have been found with only half of their stems exposed and vegetating, the other half buried in it, and probably many of them do not see the light ten times in a century, having only in the course of that time a vegetation of a few brief weeks, but a sleep for many winters and years. These plants, however, are exclusively such as grow on the summits of mountains or near the poles. Yet there is not a little caprice and mystery even regarding these; for though Norway, Lapland, and Greenland, furnish plants analogous to those of the Swiss Alps and Pyrenees, but few or perhaps none of them are seen in Siberia, Kamschatka, or even in the polar regions of America.

In fact, it appears that the dissemination of plants is not always regulated by parallel distances from the equator. Towards the south, America, Africa, and Asia, towards the north, Europe, Asia, and America, are far from producing the same vegetables under the same parallels; while many vegetables grow wild in each of these divisions of the globe, brave every opposition, and propagate themselves in a direction quite at variance with that which a similar climate would point out.

In the great valleys of the Pyrenees, these things hold true in a most striking degree. The *Dianthus Superbus* runs through the valley of Campan and Gavarnie, without ever entering any of the side ones. The *Box tree*, so very robust, is affected by elevation like the most delicate shrub. At the base of the Pyrenees, both on the French and Spanish side, it covers every hill; thence it enters the great valleys running from the north-east towards the south, but never leaves them; in vain do the numerous branches of these valleys offer it an asylum; it passes every opening, and keeps on in its first direction, stopping however on the crest of the chain at about 2000 metres above the level of the sea, and appearing again on the other side at a similar elevation and direction, from which it does not depart. Thus it is plain that local influences are most strongly traced in mountainous countries. The lapse of ages, and especially the influence of man, have introduced many modifications and exceptions, at the same time, to this general design of nature; for in traversing the deserts of these regions, among the rare plants, some few of the commonest here and there appear. If the verdure has a deeper tint than usual, contrasted with the Alpine herbage, the ruins of a hut, or a rock blackened by smoke, explain the phenomenon. A shepherd may have sojourned for a short time at such a place, and in driving his flocks, have attracted, without being aware of the fact, the birds, the insects, and the seeds of the plants familiar around his lowland abode; and whether he return or not, he has left indelible impressions of his progress; so much influence has man over the rudest and largest spaces of country.

Sometimes man proclaims his presence by destruction; his axe or his firebrand devastates forests; for these are not his abode. His wants, his danger, or his love of the absent sunshine, prompt him to use his terrible power. Accordingly the seeds of woodland plants become dormant when dried by the sun and wind. Other vegetables take their places. The climate itself changes, and thus the face of the globe where man dwells is more changed in one century, than in twenty where he is unknown and unfelt.

Still, in Alpine lands, the different soils, and their productions, will necessarily retain most of their original character; for their primitive distributions in that respect, as well as concerns their vegetation, is least disturbed. The influence of the air is most perceptible in these regions, and thus it happens, that while the geologist studies the structure of the earth from such massive features as mountains present to him, the horticulturist who would unravel the mysteries of primary vegetable dissemination and subsequent propagation, may derive hints for successful cultivation and improvement, in the paradise around his comfortable dwelling in the plains below.

* Upon this statement a distinction may be made by saying that it holds true only of mountainous plants.

## ROMAN FRUITS.

SUBJOINED is a list of those fruits cultivated at Rome, in the time of Pliny, that are now grown in English gardens.

*Almonds,*

Both sweet and bitter, were abundant.

*Apples.*

Twenty-two sorts at least; sweet apples for eating, and others for cookery. They had one sort without kernels.

*Apricots.*

Pliny says of the apricot, "quæ sola est odore commendantur." He arranges them among his plums.

*Cherries*

Were introduced into Rome in the year of the city 680, seventy-three years before the birth of our Saviour; and were thence carried to Britain 120 years after. The Romans had eight kinds.

*Chestnuts.*

They had six sorts, some more easily separated from the skin than others, and one with a red skin; they roasted them as we do.

*Figs.*

They had many sorts, black and white, large and small; one as large as a pear, another no larger than an olive.

*Medlars.*

They had two kinds, the one larger, and the other smaller.

*Mulberries.*

They had two kinds of the black sort, a larger and a smaller. Pliny speaks also of a *mulberry* growing on a brier; but whether he means the *raspberry* or the common *blackberry* does not appear.

*Nuts.*

They had *hazle-nuts* and *filberts;* they roasted their nuts.

*Pears.*

Of these they had many sorts, both summer and winter fruits, melting and hard; they had more than thirty-six kinds; some were called *libralia*; we have our *pound* pear.

*Plums.*

They had a multiplicity of sorts, black, white, and variegated; one sort was called *asinina,* from its cheapness, another *damascena,* which had much stone and little flesh: it seems to have been what we now call *prunes.*

*Quinces.*

They had three sorts; one was called *chrysomela* from its yellow flesh; they boiled them with honey, as we make marmalade.

*Services.*

They had the apple-shaped, the pear-shaped, and a small kind, probably the same as we gather wild, possibly the *azarola.*

*Strawberries*

They had, but do not appear to have prized; the climate is too warm to produce this fruit in perfection, unless in the hills.

*Vines.*

They had a multiplicity of these, both thick-skinned and thin; one vine growing at Rome, produced twelve *amphoræ* of juice—eighty-four gallons.

*Walnuts.*

They had soft shelled and hard shelled, as we have. In the golden age, when men lived upon acorns, the gods lived upon walnuts.

As a matter of curiosity, a list of the fruits cultivated in our English gardens in the year 1573, may be given, as taken from a book entitled Five Hundred Points of Good Husbandry, &c. by Thomas Tusser. He had received a liberal education at Eton and Cambridge, and was for many years a farmer in Suffolk and Norfolk. He afterwards removed to London, where he published the first edition of his work under the title of One Hundred Points in Good Husbandry. In his fourth edition, from whence this list is taken, he first introduced the subject of gardening, and has given not only a list of the fruits, but also of all the plants then cultivated in our gardens, either for pleasure or profit, under the following heads: "Seedes and Herbes for the Kychen, Herbes and Rootes for Sallets and Sawce, Herbes and Rootes to boyle or to butter, strewing Herbes of all sorts, Herbes, Branches and Flowers for windowes and pots, Herbes to still in summer, Necessarie Herbes to grow in the gardens for Physick not reherst before." This list consists of more than one hundred and fifty species, besides the following fruits:—

Apple trees of all sorts.
Apricockes.
Barberries.
Bollesse black and white.
Cherries red and black.
Chesnuts.
Cornet plums.
Damisens white and black.
Filberds red and white.
Gooseberries.
Grapes white and red.
Grene, or grass plums.
Hurtil-berries.
Medlars or merles.
Mulberry.
Peaches white and red.
Peeres of all sorts.
Peer plums black and yellow.
Quince trees.
Raspis.
Reisons (probably currants are meant).
Small nuts.
Strawberries red and white.
Service trees.
Wardens white and red.
Wall nuts.
Wheat plums.

*The Earth.* By ROBERT MUDIE, Author of "The Heavens," "The British Naturalist," &c. &c. London: Ward and Co. 1835.

THIS elegant volume, in shape and substance, is a suitable companion to "The Heavens," by the same author, which was published a few months ago. His purpose is (and he is remarkably felicitous in its execution) to treat of certain departments of nature in popular phraseology, laying aside the formal and scholastic language that was wont alone to be applied to natural science, so as to render every such subject inaccessible to the bulk of mankind. At the same time, however, that he handles his subjects in a way to make them generally understood and practically useful, he takes his stand upon the soundest philosophic principles. His illustrations and modes of illustration are alone new, and it is on this account, having made their import level to ordinary minds, that he may be said to have extended the range of science in no slight degree. This he has done, not merely by the plain and novel nature of his arrangement and detail, but by the elevated warmth of his style, and the intense love which he displays for such studies and disquisitions.

In treating of the Earth, Mr. Mudie has not attempted a particular exposition of any of the sciences, into which it is found necessary to divide a thorough study of our planet, but only to give a comprehensive and clear view of it, considered as a whole. In doing so, he has chiefly dwelt on what are

the great component parts of the globe, and next, upon the operations of these causes which produce the different climates and productions of its several regions. As the vegetable kingdom, and the objects immediately connected with this branch alone have a claim upon our attention in this Magazine, and as this forms but one of the subjects embraced under the word "Earth," we can only look to a limited portion of the present volume. Nor, in extracting a few passages, shall we attempt combining them by any continuous or connected order. Our purpose is merely to show how the author, and how all others, if they choose, may study the book of nature for themselves, and with endless delight and profit, as displayed in any one of its departments—say, its vegetable features. Are not such facts as the following sufficient to stimulate the mind of any one to pleasurable inquiry and wonder? The author is speaking of the great Mediterranean basin, and remarks—

"That as this central portion of Europe and Asia is cut off by mountains, or natural boundaries of some kind or other, from the action of the great oceans, so it serves to connect very great extremities of climate both in latitude and longitude, and its natural history becomes in consequence equally varied, interesting, and instructive. Taking it to the extent which we have mentioned, its northern boundary is swampy forests of pine, or, farther to the eastward, *steppes* or plains which are nearly destitute of vegetation, at least at certain seasons, and are at other seasons covered with pools of stagnant water, in many instances impregnated with salt. On its eastern boundary we have in succession the pine, the cedar, and the cypress, till we come to the acacia and the date palm in the southern climates; on the west we have the pine, the larch, the oak, the beech, and other deciduous trees, according to the soil and the elevation; and through them we gradually pass through the olive, the cork oak, and the orange, until we again reach the country of the date, which last may be said to be the ultimate tree on the margin of the African desert, by which the countries on the shores of the Mediterranean are cut off from the rest of Africa, farther to the south.

"There are other changes which it is desirable to be acquainted with. At the western part of this great extent of country the climate and weather partake, to some extent, of that habitual variableness without extremes of seasons, which we experience in our insular situation; and as we proceed eastward, and approach nearer to Siberia, the weather is more regular to its seasons; but the character of those seasons are more extreme.

"The ridges of mountains and other interruptions, extending from east to west, break the continuity over the greater part of the longitudinal stretch; but there is one meridian which may be considered as affording an ample play to the whole northward and southward character of the region. This is nearly about longitude 32° east of London, or the situation of the Nile in the south, and between the mouths of the Dneiper and Don on the north; and here there is almost equal fertility in regions nearly 1,500 miles apart in latitude, and less difference in the character of their productions than we would be apt to suppose. The country which lies immediately to the north of the Black Sea is not indeed a country of palms, like that on the banks of the Nile; but both are equally rich in grain and fruits; both are enriched by the overflow of the rivers, and many of the fruits of both are exactly the same; and, because of the rich soil deposited by the rivers, and the uninterrupted heat of the summer, they flourish better to the north of the Black Sea than in perhaps any other part of Europe.

"The most remarkable distinction between the rivers of southern Russia and the Nile, as affecting the general economy of nature on their banks, and in the intermediate regions, is the different times at which their overflows or inundations take place; and as the causes of these are also of an opposite character, and tend to throw some light upon the connexion of tropical and polar influence, we shall mention them, reserving the full explanation to our notice of the *Air*, as that is the grand medium of intercourse between climate and climate on the earth's surface.

"The overflowing of the Nile is occasioned by the rains which fall seasonally in central Africa; and in that part of the country whence the Nile is chiefly supplied with its water, the rains begin to fall in June, about the time when the sun is at its greatest apparent declination northward, or vertical at the northern tropic, or parallel of $23\frac{1}{2}°$. The flooding of the Russian rivers is produced by the melting of the snows which have fallen in the central part of Russia in early winter, and which, as they lie on a flat surface, and melt very quickly when the thaw does set in, leave great part of the surface flooded with stagnant water, which creeps slowly to the rivers; and, as their currents are also sluggish, they expand to the width of seas; and the inhabitants of the villages, whose houses are erected on tall posts, have no intercourse with each other for some weeks, except by boats; but no sooner is this inundation over, than the ground is covered with most luxurious vegetation, as if by magic, and the richness of the year far more than repays to the people the slight inconvenience to which they are subjected by the flood."

Take the valley of the Mississippi, and consider the causes of its vegetable luxuriance and phenomena.

"The forests in this immense valley consist of various kinds of timber. On the north side of the Mississippi portion, toward the great lakes, the prevailing timber on the light and dry lands is pine, and on those of better quality there is a great variety of deciduous trees, oaks, walnuts, maples, and an endless variety of others, generally differing in their species from European trees of the same genera, and more rapid in their growth, and more gorgeous in their foliage, but for the most part inferior in the compactness and durability of their timber. There is one character of these deciduous forests of North America which renders them highly valuable in ornamental plantations, and that is the richness and varied successions of the autumnal tints. Some of our native trees fade into various shades of brown and russet, and others pass into the 'seared and yellow leaf,' preparatory to shaking off their summer attire, and taking their winter's repose; but the American trees display colours far more rich, and, along with every shade of brown and olive, there are the purest yellow, and the most intense crimson. Those beautiful colours are of longer duration also than the autumnal tints of our trees, and though the subject has not been investigated in a scientific manner, there is no doubt that these autumnal changes of colour are in proportion to the variations of temperature at that season, while the largely developed leaves and their beautiful green in the summer are owing to the then tropical character of this most extensive and highly interesting valley. As we proceed to the southward, those pyramidal and evergreen coniferous trees, which are usually called American cedars, but which are in reality junipers, form, upon the swampy grounds, forests so thick, that not a single sunbeam can reach the surface of the earth for many square miles; and when we come to the lower parts of the valley, we find that magnificent tree, the deciduous cypress (*taxodium disticha*), which, in the form of its long and pendent feathered leaves, the softness of their green, the rich cinnamon colour of the boles and branches, and the immense size to which it grows, is one of the most beautiful trees in the forest. There are also few vegetables which rival in beauty the different species of magnolias, especially those with large tulip-like flowers of the most delicate whiteness, which come out early in the season, before the leaves, and which are as grateful to the smell as they are pleasing to the eye. It would, however, require many pages to trace even the mere outline of this region of excessive fertility—a region which, in the abundance of its productions, both animal and vegetable, is equalled by few on the surface of the globe. Yet even this is, in some respects, a ruin."

Let us see what the author says as to the action of the sun upon plants.

"Though the general effect of the sun-beams, and indeed of

heat from any other source, be to soften, and melt, and expand every substance, the parts of which are not separated from each other by this operation, yet, when the parts are separated, the result upon that which remains is often consolidation and hardening. Thus, when the solar heat drinks up the water with which clayey soil is impregnated, by turning that water into vapour, the clay becomes indurated, and, contracting, champs and breaks into deep fissures; and, in like manner, when the heat of the sun turns into vapour the moisture of the vegetation on field or in forest faster than the feeders of the vegetable can supply the waste, the herbage is burnt up, and the trees languish and drop their leaves, and, if the fervour is of sufficient continuation, they wither, and, if nature has not adapted them to endure this extremity, they die. They are curious provisions in the vegetable world for guarding against this destroying action of the sun. The plants of the desert generally have their leaves thick in substance, and covered with an epidermis, or outer skin, which is smooth, to turn away the influence of the sun by reflection, and at the same time remarkably tough, and free from any pore. But there are many of the more arid regions which still have moisture enough during one part of the year for the growth of shrubs; and many of those shrubs shed their leaves, not by withering, but by heeling off, as our deciduous trees do in the autumn, and then they go into a state of repose during the excessive heat, not dissimilar to that into which our trees and shrubs pass during the winter.

"On the trees which grow on the intermediate lands in warm climates, and which are not only evergreen, but, with short pauses, evergrowing, the leaves have, generally speaking, the same smooth and firm epidermis as the plants of the desert; and any one may observe that all evergreens which bear the rigour of winter with us without shedding their leaves, have those leaves much more firm in their texture and smooth in their surface than trees which shed their leaves in the winter; nay, so close is this connexion between the firmness and smoothness of the leaf, and the power of endurance in the plant, that among our deciduous trees the delicate leaf is always the first to fall, and the leaves which have smooth surfaces remain longer on the tree than those which have not. The mulberry and the beech are perhaps extreme instances in this country; the leaf of the mulberry is delicate, and its surface is not smooth, and mulberry leaves drop at the very first frost, without having previously shown any signs of decay, so that they may be gathered from the ground on the morning of one day as green and perfect as they were on the tree the day before. The leaves of the beech, on the other hand, are firm and smooth after they come to maturity, so that they are less eaten by insects than the leaves of most trees, and, instead of dropping at the first frost, they have a very gradual decay, and in many situations clothe the tree with a russet mantle, which lasts during the greater part of winter."

He goes on to mention the instruments by which the action of the sun is distributed over the earth, and by means of which the intercourse of nature is carried on between one place and another, viz. air and water. As to some of the principal effects which the atmosphere and the great component parts of the surface of the earth, have in modifying the action of the sun, so as to produce those differences of climate and productions which we find in different regions, he says—

"Surfaces covered with thick vegetation reflect less of the sun-beams than any others: they bear to the surface of the water nearly the same resemblance which velvet does to a mirror, and to the bare earth a resemblance not unlike that which velvet has to plain stuff. But vegetables in a state of growth absorb the greater part of the sun-beams which fall upon them; and as they present a far greater surface comparatively humid than the portion of the earth which they occupy, and as evaporation goes on—at least under the direct action of the sun—at every part of this surface, the evaporation from a close vegetation must be not only greater than from the bare earth (where there is, in truth, little to be evaporated), but greater than from the same breadth of water as the surface which the vegetation occupies.

"But the leaves of vegetables, under other circumstances, have the power of what may be called *counter evaporation*—that is, they can take out of the air that moisture which it holds suspended in a state of invisible vapour—and thus they may be, and are practically found to be, sources both of warmth and of dryness. It is easy to understand how this must be the case:—the leaves, young shoots, and indeed all the active and growing parts of vegetables, contain a great quantity of moisture in their substance, and very many of them contain far more than they can receive from the earth by means of the roots. This is not the case with air plants, which are not at all connected with the soil, or with plants that grow in the dry sands only; for it applies equally to all sorts of vegetables, excepting perhaps those which actually grow in the water. It is upon this principle that plantations of timber tend so very much to improve the climate and fertility of those countries in which they are situated, by diminishing the heat of the torrid regions, and the cold of the tropical ones; and in this we see the beautiful provision which Nature has made in the polar and the tropical forests—for, under circumstances favourable to their growth, forests are more abundant there than in the middle latitudes.

"Lands bare of vegetation always tend to increase the particular character of the climate in which they are situated, because the light of the sun acts more powerfully upon them than upon water, or upon surfaces covered with vegetation. They absorb the greater part of the heat, that is, they themselves become more heated than the others; and, instead of producing any mitigation under circumstances of great heat, by the evaporating of moisture, they act as so many furnaces, heating the air over them by means of radiation.

"But they cool as speedily as they heat, and therefore, under circumstances the reverse of those which heat them strongly, they are cooled and tend to cool the air by abstracting heat from it. Thus, surfaces of bare earth, while they are the most unprofitable that the earth can present, are at the same time subject to the greatest extremes of climate; still, however, even they have their use in the general economy, because, by the violence of their action, they serve to put in motion the currents of the atmosphere."

Of the modification arising from the earth's motion in its orbit, his reasoning is no less curious and just.

"When the sun is near the southern tropic, the action upon the whole surface of the earth may be considered a minimum, as the sun then apparently travels round the surface which is least affected by its action. The southern summer may thus be stated as the time of greatest repose for the whole earth. Generally speaking, the effect of this season upon such of the southern lands as are of considerable breadth, and not much elevated, is to burn them up with drought; for, as their surfaces get heated, the south wind, or south-east wind, which then blows upon them, is rarefied by the increased heat of the surface, and converted into a drying wind. In the small islands this is but little felt, but it tells very strikingly upon Australia, the southern part of Africa, and the plains of South America. Over a great extent of these countries, vegetation withers during this season; and the grasses or the deciduous trees of our climates could not exist. Hence, much of the vegetation is totally different, not only in its external appearance, but also in its internal structure. The whole of our native trees perform the labour of the season external of the wood, and just between that substance and the bark, where a new layer, both to the wood and to the bark, is formed in every year of the growth of the tree, and when a tree is no longer able to perform this annual function, it dies.

"Some of the southern trees, and trees of the middle latitudes (for this influence extends as far as the northern tropic, or beyond it, according to circumstances), have this habit; but then they are fortified against the excess of heat and drought much in the same manner as the pines of the arctic

lands and the mountains generally, in the northern hemisphere, are so fortified; that is, they have the bark smooth, and either covered with an impervious epidermis, or giving out in small quantity some matter which evaporates with great rapidity, so as actually to produce a condensation of water from the air, which, though imperceptible to the eye, tends greatly to the nourishment, or at all events to the refreshing, of the tree. The leaves also partake of one or other of these qualities; and, generally speaking, the trees do not labour so hard in the production of their fruit, for though there are generally succession crops upon them, they take a full year or more to bring each of these to maturity, after the appearance of the flowers. Such trees are always in leaf, and where the earth is sufficiently rich to support them, they throw a protecting shadow over the ground, which really shelters it more from the vertical sun than our trees do from the slanting sun of our climates. It is not in the regions of extreme drought, the exposed plains which are subjected for months to the intensity of the sun's action, that we meet with trees of this description. In such places the ligneous vegetation consists in general of hard and prickly bushes, which are stript of their leaves in the intensity of the drought; and in many places indeed, such bushes, and also many of the trees, are leafless, the functions of leaves being performed by enlarged footstalks, which have much of the strength and power of resistance of timber, and none of those characters which we are accustomed to regard as properly belonging to, and being descriptive of, a leaf. In more favourable situations, however, we meet with evergreen trees which elaborate, in part, their own moisture out of the air, by the evaporation of peculiar matter, and it is owing to the evaporation of this matter that such forests are so richly perfumed.

"We find a verification of this, by attending to the progress of our own seasons. In winter the fields and the forests are scentless, or the smell which they emit is simply that of fresh mould, of the withered blade, or the decaying leaf. When spring comes, and touches every little bud with his pencil of emerald, calling them forth from those swaddling-clothes by which they are shielded from the winter, and bidding them expand and perform their labours, and adorn the summer, there is freshness; but we cannot positively say there is fragrance, until the season advances and the blossom is put forth. In fact, by an attentive examination of the appearances of the year around us, and by comparing each effect with its cause, and remarking how perfectly all the beings, and all the agencies which we observe in nature, answer to each other, and promote the grand purpose of the whole, we should really derive more pleasure, and more instruction, not respecting our own neighbourhood merely, but respecting almost every spot on the surface of earth, and from all the volumes that have been written, or that can be written, upon the subject.

"From these few hints it will be perceived, that our deciduous vegetation, such of it as attains a growth sufficient for forming a sheltering mantle for the earth, works at the surface, and as near the solar action as possible: that great part of the seasonal action is in leaves, of which the epidermis is thin, so that they suck up humidity like sponges, and on the other hand, are soon withered away by the drought, or nipped by the frosts; but that the trees of the polar regions, and of our mountains, have leaves with a fine epidermis, which probably absorbs little or no moisture, and is just as unsusceptible to the alternations of heat and cold to which they are subject; and that, in those trees of tropical countries which grow at the outsides, there is perhaps greater firmness of epidermis; and there are other means by which they are enabled to resist the drought, though trees of this character, although abounding in all the more favoured spots of the intertropical countries, are not the typical trees. These last are the palms, the tree-ferns, and several other races, which do not grow by an increase of substance at or near the outside; but consist of a successive production of what are commonly called leaves, but which are in reality not leaves, in the sense in which we apply that term to the annual covering of the forest trees. They are, more strictly speaking, *fronds*—'green expansions' of the tree itself, and not separate organs, to assist in the elaboration of other matter. A plant of this kind usually rises with the same thickness of stem which it is to preserve while it lasts; and this stem is elongated by growth at the top only, upon which there is a large, and often an exceedingly beautiful crown of the fronds, in the centre of which is the single bud of the tree, protected from the heat, not only by the thick investment of the more advanced portion by which it is surrounded, but generally by a great quantity of liquid sap—a quantity so great, that the inhabitants of such countries tap it off by gallons, and prepare it either as a cooling, or as an intoxicating, liquor, according to circumstances. Those palms are often exceedingly majestic in their appearance, and attain a greater height than any other trees, excepting, perhaps, some of the pines on the west coast of North America. They are also the most durable of trees. Their leaves, or fronds, consist of long fibres, which are remarkably tough: the epidermis of many of them is not only hard and tough, but in some it is absolutely cased with an armature of flint. Their tall stems are branchless, and, considering their strength, they are exceedingly flexible and elastic; so that they bow their splendidly crowned heads to the violence of the weather, or stand armed amid the burning heat with perfect impunity, and thus live to record more revolutions of the earth in its orbit than the most ancient and stately oaks of our forests. The palm is, indeed, often used as the emblem of immortality, as well as of victory—of triumph over time, as well as triumph over enemies; and when we consider the multitudes of the human race which subsist upon the fruit, or the farinaceous substance of those stately trees, the numerous uses to which the wood and the fronds are applied, the beauty when growing, and the durability, both against decaying nature and the casualty in art, we may well cease to wonder that this family of trees should have, in all ages, claimed the attention and drawn the admiration of mankind."

In this way Mr. Mudie, in a delightful, though somewhat diffuse style, goes on to describe the general features and economy of our planet. His book will, no doubt, meet with hearty acceptance at the present day, when every work connected with science, if warmly and popularly written, is sure to be so received. We agree with him in thinking such a prevalent spirit is not the worst sign, nor the least confident promise of the happiest universal results. It is far from being one of the worst signs of the times in which we live, and far from being one of the smallest confirmations of that promise spoken by the Almighty, "that the sword shall be exchanged for the plough-share, and the spear for the pruning-hook."

## SOME OBSERVATIONS ON FRENCH GARDENING.

The British excel in many branches of horticulture, but in others the French surpass them; arising chiefly, perhaps, from a greater subdivision of skill and labour. English gardeners generally carry every sort of fruit to the market, or have the charge of a miscellaneous number of branches, under some large landed proprietor. But in France, whole villages are employed in the culture, each of one kind of fruit, and therefore, where for many generations the energies of a community have been directed to one point only, individual branches are brought to a perfection which can never be attained in a garden where plants and vegetables of all sorts are provided by one man, for a weekly market, or a large and opulent family.

For example, at Montreuil, a village near Paris, the whole population have been for several generations maintained by the cultivation of peaches, and there alone the true management of this fruit has been studied, in a manner that no written precepts can teach. So particular are they even in

their modes of winter and summer pruning, that the difference of soil, exposure, state and constitution of every single tree are attended to. Some of the best are never budded, but reared from the stone; the rest are budded on stocks of a half wild peach. Their season for budding depends on the weather being more or less wet. In order to provide stocks, the fruit-stones are sown in baskets; when the trees have attained a proper size they are sunk in the ground, where they are to grow. Peach trees budded on the almond stock are larger and more durable than others. Stocks of the apricot produce smaller trees, that bear sooner, but do not last so long.

To be sure the climate of France is more suited for the culture of this delicious fruit, than that of England; but the gardeners there are also much more careful and skilled in the matter. During the time of flowering, they resort to various methods to protect the trees from frost; such as lighting fires in such a manner that the smoke may pass over the branches at sunrise. With them peaches are never known to ripen on the tree, but are gathered just before they are quite so, and kept at least twenty-four hours in the fruit-house.

The culture of figs is the chief support of the people of Argenteuil, near Paris. Fields covered with these trees to an immense extent are to be seen facing the south, and in other places sheltered from the north and north-west winds. In autumn, the earth about the roots of these trees is dug, and as soon as the frost commences the gardeners bend down and bury the branches under six inches of mould to preserve them, stripping them entirely of their leaves, and bending them with great care. Such as will not submit are cut off close to the ground. Branches remain thus buried seventy-five or eighty days without harm. Should severe frost reach and destroy the stem, it is only the branches, not the roots, that suffer. In the spring, where a double bud appears, the leaf-buds are pinched off, in such a way as not to hurt the fruit-buds. In cool seasons the ripening of figs is hastened by letting a drop of oil from the point of a pen fall into the eye of the fruit. This plant requires to have its root cool, and its head exposed in summer to the hottest sun; in dry seasons the trees are therefore watered. Accordingly they do well in a paved court.

The French do not allow their apple or pear trees to form wild heads, as ours do, to the shading of all things near them. All their standard trees, indeed, are trained in such a manner as to cast the least shade possible. A pyramidal form is very common with them.

Mays, egg plant, and sweet potatoes, are reared in some kitchen gardens of France. The first of these is sown in ground, without heat; when the spike is about half an inch thick, it is eaten fried in butter or pickled with vinegar. The egg plant is sown on a hot-bed; the plants are afterwards put into pots, and plunged into a gentle heat. It may, after some farther time, be placed in the open air. The fruit is used for ragouts in some districts. The sweet potato is planted on a hot-bed in the middle of April, in about six inches of mould. When the shoots are eight or ten inches long, they are replanted in a bed of light mould, in the open air, all the leaves, excepting the uppermost, being taken off, and the shoot then buried so deep, that the small bunch of leaves only appears above ground. In October the tubers are ripe, and must be dug up with the greatest care, the slightest scratch disposing them to rot. Unless they be kept free from frost and damp, they will soon exhale an odour like that of the rose, and rot immediately. The French cultivate the red and the yellow varieties, preferring the red.

Strawberries are cultivated by the French as has been recommended by Mr. Knight. They find the fruit so much better that has been produced by seedlings of the first year, that they seem to prefer the Alpine to all other sorts, and to be supplied at market with the fruit of it in every month of the year, by the use of some heat in the winter.

The market gardeners near Paris sow theirs twice a year, in March, and towards the end of August. In six weeks they are large enough to be transplanted, which is done at eight inches apart. They often sow strawberries within five or six feet from a north or west wall; in the latter case, the moss is absolutely necessary. Plants grown from the March sown seed must be well watered through the summer; in hot weather, twice a day, if they are expected to bear in autumn. The August sowing, it would seem, is the most productive, which fruit in the spring following.

## A DISTINCTION BETWEEN FRUIT TREES.

Fruit trees may, in respect to their mode of bearing, be divided into annuals and biennials. Figs, walnuts, &c. are annuals, that is, they bear fruit on the branches of the present year. Peaches and pears, &c., are biennials, that is, their fruit is produced on wood of the second year's growth. In this case, much advantage is derived from the practice of rubbing off the leaf-buds of the fruit-bearing branches, leaving only as many as are wanted to produce wood for the succeeding year. This not only leaves the remaining wood to grow stronger and to ripen sooner, but it increases the size of the fruit.

## WHEN WERE POTATOES FIRST INTRODUCED INTO THE UNITED KINGDOM?

Were it possible to ascertain the primeval state of those vegetables which now occupy the attention of the gardener and agriculturist, and which immediately, or more remotely, conduce to the support and happiness of mankind; and could we trace out the various changes which art and accident have in successive generations produced in each, few inquiries would be more interesting. We are still ignorant however of the native country, and original existence in a wild state of some of the most important of our plants. As to the potato (*solanum tuberosum*), it is pretty clear that it was brought to England by the colonists sent out by Sir Walter Raleigh, under the authority of his patent, granted by Queen Elizabeth, "for discovering and planting new countries, not possessed by Christians," which passed the great seal, in 1584. Some of Sir Walter's ships sailed in the same year, others, on board of which, was Thomas Herriott, afterwards known as a mathematician, in 1585; the whole however returned, and probably brought with them the potato, on the 27th of July, 1586.

Herriott, who was probably sent out to examine the country, and report to his employers the nature and produce of its soil, wrote an account of it, which is printed in De Bry's Collection of Voyages. In this account, under the article of Roots, he describes a plant called *openawk:* "These roots," says he, "are round, some as large as a walnut, others much larger; they grow in damp soil, many hanging together as if fixed on ropes; they are good food either boiled or roasted." Gerard, in his Herbal, published 1597, gives a figure of the potato, under the name of potato of Virginia, and says that he received the roots from Virginia. The manuscript minutes of the Royal Society tell us that Sir Robert Southwell, then president, informed the fellows, at a meeting, that his grandfather brought potatoes into Ireland, who first had them from Sir Walter Raleigh. In the sister isle, the plant seems to have been cherished and cultivated for food long before the good people of England knew its value. Gerard indeed, who had the first in his garden in 1597, recommends the roots to be eaten as a delicate dish, and not as common food.

It appears, however, that it first came into Europe at an earlier period, and by a different channel; for Clusius, who at that time resided at Vienna, first received the potato in 1598, from the governor of Mons, in Hainault, who had procured it the year before from one of the attendants of the Pope's legate, under the name of *taratoufli;* and learned from him, that in Italy, where it was then in use, no one certainly knew whether it originally came from Spain or from America.

Peter Cieca, in his *Chronicle,* printed in 1553, says that the

Cortusa Matthioli.

Inula Helinum

Blakea Trinervia.

Perola Umbellata.

inhabitants of Quito and its vicinity have a tuberous root, which they eat, and call *papas*. From these statements we may infer that potatoes were first brought into Europe from the mountainous parts of South America, in the neighbourhood of Quito; and as the Spaniards were the sole possessors of that country, there is little doubt of their having been first carried into Spain some years before the Italians could become acquainted with them.

The name of the root in South America is *papas*, and in Virginia it was called *openawk:* the name potato was therefore evidently applied to it on account of its similarity in appearance to the *battata*, or sweet potato; and our potato seems to have been distinguished from that root by the appellation of potato of Virginia, till 1640, if not longer.

Some have asserted that potatoes were first discovered by Sir Francis Drake, in the South Seas, and others, that they were introduced into England by Sir John Hawkins; but in both instances, according to Sir Joseph Banks' authority, it is the sweet potato, which was used in England, as a delicacy, long before the introduction of our potatoes. Shakespeare says, "Let it rain potatoes, and hail kissing comfits;" these said comfits being principally made of sweet potatoes and eringo roots. The potatoes themselves were sold by itinerant dealers, chiefly in the neighbourhood of the Royal Exchange, and purchased, when scarce, at no inconsiderable cost, by many who conceived that they possessed the power of restoring decayed vigour. The allusions to this opinion are very frequent in the plays of that age.

## DESCRIPTION OF THE PLATES.

### CORTUSA MATTHIOLI.

BEAR'S-EAR SANICLE.

Pentandria Monogynia.—Linn.

Primulaceæ.

This plant sends out many oblong smooth leaves, a little indented on the edges, forming a sort of head, like the *auricula*. The peduncle comes out in the centre of the leaves, rises about four feet high, and supports an umbel of flowers, each on a slender, short pedicel; they are of a flesh colour, and spread open like those of the auricula.

This plant is recorded by Matthiolus to possess a virtue, which, though of little use to the mountain nymph, may perhaps recommend it to the pale-faced belles of crowded cities; the leaves applied to the cheeks, and shortly removed, occasion a beautiful colour, resembling that from the finest rouge, which after some time disappears, without injury to the skin.

It is a hardy perennial, native of the Alps, Austria, &c., flowers in April and May, requires a shady and moist situation, propagated by parting the roots in the same manner as is practised for auriculas.

### INULA HELINUM.

COMMON INULA, OR ELECAMPANE.

Syngenesia Polygamia Superflua.—Linn.

Compositæ.

Elecampane has a perennial, thick, fusiform, brown, branching, aromatic root. It is one of the largest of our herbaceous plants, being from three to five or six feet high, with the stem striated and downy, branched towards the top. Lower leaves on footstalks, lanceolate, a foot long, and four inches broad in the middle; upper embracing, ovate lanceolate, wrinkled, serrated or toothed, deep green, and slightly hairy above, whitish green and thickly downy beneath. Flowering heads very large, single, terminating the stem and branches. Outer scales of the calyx ovate lanceolate, like the leaves; inner bluntly ovate, tomentose. Florets all yellow, those of the ray narrow, linear, from an inch to an inch and a half in length, with three sharp teeth at the end. Seeds columnar, four-cornered, obscurely striated, smooth, cinnamon bay-coloured, with the rim of the umbilicus cartilaginous and white. Pappus, egret, or down white, twice as long as the seeds, appearing to be capillary, but when viewed with a glass, finely toothed on one side; shorter than the florets, sessile. Receptacle wide, smooth, hollow-dotted, or with very small angular holes, scarce sensibly toothletted at the edge.

The root is esteemed a good pectoral, and a conserve of it is recommended in disorders of the breast and lungs, as good to promote expectoration. An infusion of it fresh, sweetened with honey, is said to be an excellent medicine in the hooping cough. A decoction of it, applied outwardly, is said to cure the itch. Bruised and macerated in urine, with balls of ashes and whortle berries, it dyes a blue colour. A decoction of it cures sheep that have the scab; hence it is called in some countries scab-wort; in others it has the name of *horse-heale*, doubtless from its reputed virtues in curing the cutaneous diseases of horses.

It flowers in June and July, and the seeds ripen at the end of August. It is propagated by off-sets, which, if carefully taken from the old roots with a bud or eye to each, will take root very easily; the best time for this is the autumn; as soon as the leaves begin to decay, these should be planted in rows, about a foot asunder, and nine or ten inches distance in the rows; the spring following the ground must be kept clean from weeds; and if in autumn it is slightly dug, it will promote the growth of the roots; these will be fit for use after two years' growth. It loves a gentle loamy soil, not too dry.

### BLAKEA TRINERVIA.

THREE-RIBBED BLAKEA.

Decandria Monogynia.—Linn.

Melastomeæ.

Leaves opposite, oblong-ovate, petioled, quite entire, coriaceous, the three nerves underneath protuberant, blackish. Flowers opposite, solitary.

This vegetable is certainly one of the most beautiful productions of America. It is but a weakly plant at first, and supports itself for a time by the help of some neighbouring shrub or tree; but it grows gradually more robust, and at length acquires a pretty moderate stem, which divides into a thousand weakly declining branches, well supplied with beautiful rosy blossoms on all sides, that give it a most pleasing appearance in the season.

It is chiefly found in cool, moist, and shady places, and grows generally to the height of ten or fourteen feet; but rises always higher when it remains a climber, in which state it continues sometimes. It thrives best on the sides of ponds or rivulets, and those that would choose to have it flourish in their gardens, where it must naturally make a very elegant appearance, ought to supply it with some support while it continues young and weakly.

It is usually kept in the stove with other Jamaica plants, and propagated by layers.

### PYROLA UMBELLATA.

UMBELLED WINTER GREEN.

Decandria Monogynia.—Linn.

Ericeæ.

Root very long; stem upright, or a little decumbent at the top; naked at the bottom, hard and woody, roughened here and there with tubercles; leaves opposite, or heaped in whirls, or scatteringly in the middle of the stem and branches, cuneiform lanceolate, blunt, serrate, rigid, dark green above, pale green beneath, smooth, shiny, hard, from one to two inches in length, from four to six lines in width. The common peduncle is continued from the stem and branches, and at the top of it are three or four peduncles, bearing each one flower, forming a sort of umbel, and hanging down. Flower reddish white, anther whitish. Stigma capitate, obtuse.

*Pyrola Umbellata*, although widely diffused through the northern parts of Europe, Asia, and America, is not a native of Great Britain. It is the most beautiful of all the genus; flowers in June, and continues a long time in bloom. Requires to be kept in bog earth, to be frequently watered, and sheltered from the mid-day sun.

## PROTEA MUCRONIFOLIA.

DAGGER-LEAVED PROTEA.

Tetrandria Monogynia.—Linn.

Proteaceæ.

Leaves lanceolate, linear, mucronate, pungent, with an obtuse base. Bracteas, lanceolate, mucronate, smooth. Stem erect, many flowered.

In the delicate velvety white involucrum with which the head of flowers is surrounded, together with the strong contrast of the red anthers upon the feather tipped petals, consists the beauty of this species. It is a native of the Cape of Good Hope. Flowers in October. Requires the protection of a greenhouse, and a treatment similar to the rest of the genus.

## CYMBURUS MUTABILIS.

CHANGEABLE CYMBURUS.

Diandria Monogynia.—Linn.

Verbenaceæ.

The stem becomes somewhat woody, with widely separating branches, sharply four-cornered and hairy. Leaves yellowish-green. Petiole half an inch long or more, convex on the upper side, bordered with the lamina decurrent almost to the bottom. Lamina two and a half to four inches long, ovate, serrated, obtuse, hairy, paler and more nappy underneath, wrinkled. Flowers in a long spike. Peduncle hollowed out for each flower, as in some of the grasses. Bracteas shorter than the calyx. Calyx half an inch long, exceedingly compressed with two deep furrows next to the peduncle, hairy externally. Corolla an inch long or more. Tube dark red, with a whitish bottom, cylindrical, on one side within thickly bearded with erect hairs. Limb deep scarlet, gradually changing to a lilac tinge, more than twice as long as the tube; externally slightly viscid, pubescent; its lower part only a little wider than the tube, somewhat compressed with two furrows in front, where it is internally bearded above the insertion of the barren filaments, up to its mouth, in the same manner as the tube is below the insertion of the fertile filaments; its upper part horizontal, with a deep purple heart-shaped mark about the mouth, divided into five short rounded segments, of which the two uppermost are widest, and the middle of the others narrowest. Filaments whitish, short, bearded on one side; bearded ones very narrow. Anthers pale yellow, the upper lobe shorter, and placed perpendicularly over the other. Pollen consisting of three or sometimes four globular bodies confluent with a still larger central one. Pericarpium only consisting of a thin pellicle adhering to the seed, but continuous with the style. Style pale yellow, reaching to about the mouth of the limb; smooth. Stigma green, cup-shaped, smooth.

The apparatus of hairs in the corolla, conjectured to prevent minute insects from robbing the flowers of their honey, is very curious.

This shrub is a native of South America, and requires care and protection. The seed should be sown upon a hot-bed early in the spring, and when the plants are fit to remove, they should each be transplanted into a separate small pot, and plunged into a fresh hot-bed, shading them till they have taken fresh root.

## MAGNOLIA ANNONÆFOLIA.

ANNONA LEAVED MAGNOLIA.

Polyandria Polygynia.—Linn.

Magnoliaceæ.

Leaves evergreen, elliptical, oblong. The old ones smooth; the younger ones and branches fuscous downy. Flowers erect. Of all the magnolias with which we are acquainted, this species is the most elegant, whether for the growth of the plant, the brilliancy of the foliage, or the extreme delicacy, fragrance, and beauty of the flowers.

It is a native of China. The flowers appear in the month of February, the general season of its flowering in this climate, if kept in the hot-house; to which station it has, as yet, been doomed, although, from the general character of the genus, we should be led to treat it more hardly. The plant from which our drawing was made did not exceed a foot and a half in length, which leads us to suppose it never becomes a large shrub even in China. It is increased by cuttings and layers, but the first is the best method, as in the latter mode the branches do not take root under two years. It thrives in leaf mould and light loam.

## GOODIA LOTIFOLIA.

LOTUS LEAVED GOODIA.

Diadelphia Decandria.—Linn.

Leguminosæ.

Stem slender, while very young thinly scattered over with fine hairs. Stipules distinctly from the petiole, closely imbricated, long, wedge-shaped, caducous. Leaves glaucous, 2-nate, with an odd leaflet. Petiole slender, scarcely longer than the leaflets. Leaflets oval, sometimes ovate; while very young, scattered over their under surface with fine hair. Flowers in a long spike. Bracteas three, small and caducous. Calyx yellowish-green, and very round at the base. Standard yellow, with two deep spots above the claw, visible on both surfaces. Wings transversely wrinkled, and towards the base of a sooty colour. Keel greenish yellow. Filaments diadelphous. Stigma terminal, capitate. Legume hatchet-shaped.

It is a hardy green-house shrub of handsome growth. Flowers in May, June, and July. Propagated by cuttings and seeds.

## VIOLA TRICOLOR.

HEART'S EASE, OR PANSEY.

Pentandria Monogynia.—Linn.

Violaceæ.

Stem angular, diffuse. Leaves oblong, toothed, crenate. Stipules lyrate, pinnatifid. Corolla twice as long as the smooth calyx.

The improvement which has been made in this flower, in a short time, is equal to that of the dahlia in the same period, and its varieties seem almost as interminable. But a few years ago they were diminutive things, banished from gardens with as much industry as would be applied to *couch-grass*, and now we have splendid varieties, to the amount of several hundreds, brilliant in colour, immense in size, and beautiful in form. The present variety is distinct in character and colour. The heart's ease require but little culture; they grow best in a rich shady border, and may be parted often—the smaller plants bearing larger flowers than overgrown roots.

## GOMPHOLOBIUM PSORALEÆFOLIUM.

PSORALEA-LEAVED GOMPHOLOBIUM, OR FRINGED AIR-POD.

Decandria Monogynia.—Linn.

Leguminosæ.

The branches are angular, smooth, minutely dotted. Leaves scattered, ternate, almost sessile; their leaflets smooth, veiny, entire, oblong. Stipules very minute. Flowers on axillary bracteated stalks, generally solitary, large and handsome, remarkable for a dense white woolly fringe which borders their keel. Pod inflated, spherical, of one cell, with many leaves.

The young stem, if observed through a microscope, is covered with dark green dots. The calyx, in a young state, is very similar, both in colour and shape, to the future pod, so that the whole plant, to a careless observer, has the appearance of being in fruit before it flowers.

Native of New South Wales. It may be propagated by cuttings.

Protea mucronifolia.

Cynburus mutabilis

Magnolia annonæfolia.

Goodia lotifolia.

Viola tricolor. *Var.*

*Pl 29.*

Gompholobium psoraleæfolium.

## LATE IMPROVEMENTS IN GARDENING.

After the general directions which we have given to enable our readers to superintend and manage their gardens, each month in the year, it will help to complete their knowledge on this branch, if we take notice of certain considerable improvements which have been made in it within the last few years, but which we could not conveniently so particularize in the series of directions already alluded to. We shall name and describe the cultivation of these late additions and improvements, as shortly and distinctly as is in our power.

### *Kitchen Garden.*

There is a kind of broccoli, called the Cape broccoli that has a claim on our attention in the list we are now entering upon. Its flavour is of a superior order, but without good management it will shoot into flower. Two crops are sown in the middle of April and May, the first on any border of light soil. The plants may be removed in a month into sandy loam, manured; and should not stand more than two feet apart. Frequent hoeing is necessary. The second crop should be planted in pots directly from the seed-bed. Sink the pots until the broccoli heads are formed. If these pots, in the end of November, are placed in a glass frame, very fine broccoli may be had in the depth of winter.

Sea-kale is now an important market vegetable in Covent Garden. It requires to be trenched at least two feet deep in a light soil, and having a dry bottom. New dung or coarse manure are bad for it, as the shoots imbibe the disagreeable flavour thence communicated. Sea-weed and rotten leaves are the best manure. The plant may be propagated by offsets, or by small pieces of the root, having eyes or buds attached to them; it rises, however, freely from seed, sown in patches in March, and leaving fully two feet between each patch. During the first two years it must be well hoed and weeded. At the approach of winter, some scatter a little light stable dung or fresh sandy soil over the whole bed. In the third year, the plants are fit for blanching; and if the bed be well managed, it will continue productive for several years. It is proper, however, to sow a small bed every year, to secure a succession of vigorous plants. Fresh seed may be kept in readiness, by allowing two or three plants to produce their flowers and seeds each year; the flowers, which are white and smell of honey, appear in May, and the seeds in September.

In the first volume of the Memoirs of the Caledonian Horticultural Society, Sir George Mackenzie describes a superior style of blanching. The sea-kale bed is covered early in spring with clean and dry oat-straw, which is removed as often as it becomes musty. The shoots rise through the straw and are at the same time pretty well blanched. Tree leaves have been employed for this purpose, and a thin covering of stable dung will be found sufficient to keep the leaves from being blown about, and will promote the production of the sea-kale shoots, a slight fermentation being thus induced. The shoots rise sweet and tender among the leaves, in the early part of spring. The difficulty, and therefore objection to this method, is as to the regulation of the heat of fermentation. There is another method, which consists in placing over each plant a flower-pot of the largest size, inverted. Pots have been invented for this purpose. Each pot during the season, will, upon an average, yield a dish and a half of shoots. By this means sea-kale is forced with great facility. In autumn the plants are dressed off in the open border, that is, the stalks are cut over, and all decayed leaves are removed. The ground is at the same time loosened around them, and a thin covering of fine gravel, or sifted ashes, laid on the surface. A pot with a moveable lid is now placed over each plant, or patch of plants, and stable litter is closely packed all round the pots, and pressed firmly down, to the depth of a foot or more; but the fermentation produced should never exceed 60 deg. of Fahrenheit. In the space of a month shoots will be ready for cutting; and successive shoots may be thus obtained throughout the winter. This plan of forcing sea-kale has superseded the planting of it in hot-beds, under glass frames, where it has been tried.

The preservation of cauliflowers through the winter has been accomplished thus:—At the end of October the firmest and best shaped are lifted with a ball of earth attached to the roots, and arranged round the borders of the peach-house, or vinery, close together, but without touching. The larger outside leaves are removed, and any points of leaves that immediately overhang the flower. While the houses are kept without fire, in the first part of the winter, mats and straw are used to cover the plants from frost. They may also be planted in hot-bed frames, the glass being drawn off in mild days; covering them with mats &c. as the weather becomes severe, and carefully removing all decayed leaves.

American cress, is a biennial variety of ours, *erysimum præcox*, and much resembles the common winter cress, *E. Barbarea*, although its leaves are pleasanter and milder. It has latterly become a favourite salad, and may be sown at two or three times during the summer, either broadcast, or in drills a foot asunder, on a light soil. When the outer leaves are gathered, it should be so managed that the new ones are regularly produced. Make a late sowing in August or September, on a sheltered border, and the plants will afford leaves till March.

The *Valentia* and *Salonica* melons are modern favourites. The former has reached us in our intercourse with the Peninsula, and will keep many weeks. It is, generally speaking, to be managed like the common melon; the fruit, gathered when nearly ripe, and suspended in a dry, airy room, will keep till February. It is of a lozenge or long oval shape; the skin thin, and of a dark-green colour; the pulp whitish, firm and juicy. The Salonica is nearly spherical, with a smooth face, and of a golden colour; the pulp of the same general appearance as the Valentia, but more abundant in saccharine. Mr. Knight's directions respecting the preservation of the leaves of melons are valuable. Many old horticulturists have stripped the plant of them, as he contends, most injudiciously, the fineness of the fruit being thereby sacrificed. He recommends the employing of pegs more freely, both to keep the plants, and the roots particularly, in their places, and the leaves upright and steady.

In a previous number of our Magazine, we have described Mr. Knight's method of raising onions, so that they rival the Spanish in size. The same gentleman has obtained a new and most beautiful pea, by pollen taken from different varieties of blossom, white and gray, the plant generally rising to the height of eight or ten feet. In exposed situations it is apt to be injured by the winds; but in sheltered places, and with the aid of stakes, it proves extremely productive. The blossoms are large and white, and both the pods and the peas are large, the latter being of a cream colour. When they begin to dry, they shrivel in some degree, and hence the name of *Wrinkled Pea* has been given them. When boiled the flavour is particularly rich, nor has any yet been found to yield an equal quantity of saccharine. It should not be sown before April or May.

Though potatoes have been improved under the auspices of the Horticultural Society, a hardy growth of them seems yet to be wanting.

Rhubarb stalks have grown annually, of late years, into greater repute. By the employment of young seedling plants, the proper removal of leaves, and the keeping of the plants from flowering, the succulent stalk, when properly dressed, makes a delicious tart, preferred by some to that made of apples. In the open ground the stalks are produced from April till mid-summer. Vegetation may be hastened during March, by throwing over the plants some loose haum, care being taken not to injure the roots. Rhubarb may be forced much in the manner of sea-kale, but the stalks become thus not only

of a lighter colour, but have less of the peculiar flavour of the plant. Mr. Knight mentions a method of forcing rhubarb by planting it in pots. In the beginning of winter a number of roots are dug up, and placed in some large and deep pots, each being made to receive as many as it will contain. Some fine sandy loam is then washed in, so as closely to fill the interstices between the roots, the tops of which are so placed as to be level with each other and about an inch below the surface of the mould in the pots. The pots are placed in any kind of hot-house; and other pots of the same size are inverted over them. If water be freely supplied, vegetation proceeds very rapidly; three successive crops of leaf-stalks may generally be obtained. The shaded spaces of vineries or peach-houses, which are generally unoccupied, are well suited for this operation.

Brussels sprouts, which are the smaller rosettes of the stem leaves of this kind of cabbage, are very delicate eating, and have come into popularity. The seed is to be sown in spring, and seedlings planted out before midsummer, on showery days. The plants grow as high as three feet, and the sprouts form a narrow pyramidal growth round the stem. In October the plants should be furnished round the roots with additional earth. The earliest sprouts become fit for use in November; and if the weather be mild, they continue good, or even improving, till March. Two or three of the best plants, with the rosettes small and closely set, should be allowed to run to flower, for a supply of seed. If the sprouts are more than half an inch in diameter, they are thought to be too large. In spring, when the plants have a tendency to run to flower, they are checked by transplanting them to a cooler situation.

The Maltese turnip, a fine yellow variety, of a round shape, and very smooth skin, has been much cultivated of late years: it is best preserved in sand during winter. It resembles the Aberdeen yellow turnip in appearance. The *naveu navet* of the French, is a variety of our *brassica napus*, first cultivated in this country during the late war. The cultivation is similar to that of other turnips; but the root, which is carrot-shaped, is of much higher flavour. It is put whole into soups, after being scraped.

*The Flower Garden and Shrubbery.*

The additions to the rose tribe of late years, embrace a number from China, as Lady Banks', the Blush, the Crimson, and the Macartney. Some varieties of the crimson China rose, with semi-double flowers, are singularly beautiful. Varieties of the Scots and Ayrshire roses have extended through England. The latter is the Rosa Capreolata of Don.

Several Japan shrubs have also been adopted, as highly ornamental; such as the Japan apple, the gold plant, &c. From Ireland have been brought some ornamental evergreens, such as a broad-leaved ivy, the finest of the tribe. There is also a yew remarkable for its upright growth, and fine dark foliage. The Irish furze has a beautiful upright appearance. The Siberian lilac is a pretty shrub, that has not been very many years known in this country. The size of the leaf is between that of the two old species. The yellow-flowered currant makes also a fine appearance when in blossom. It requires shelter, or to be trained. The tree-peony, or montan, is also planted in a sheltered situation, and forms a beautiful ornament to the garden or shrubbery when in flower. Dahlias, showy geraniums, acacias from New Holland, and heaths from the Cape, are all in high repute.

*Fruit Garden and Nursery.*

It is in this department that perhaps the greatest improvements have lately been made; nor can any one individual be named, who has done so much for it as Mr. Knight, whose ingenuity and knowledge are exhaustless. Apples and pears have been greatly improved by him. We owe to him the yellow Ingestrie pippin, the Scotch nonpareil, and the Braddock nonpareil. The Downton pippin, so named after his seat, is well known. America has yielded the important addition of the Newtown pippin of Long Island, which is a fine dessert apple, similar to the nnet; it keeps well; is in perfection in January, and continues good till March and April. In this country, the tree requires a wall with a good aspect. The American nonpareil is a high-flavoured apple, introduced not many years ago. It flourishes best on a west wall. The Canadian rennet may be added as a good wall apple. Other introductions might be mentioned, but we go on to observe, that the Wormsley bergamot, and the Bon Chretien, much cultivated near London, are important new varieties. The former has been raised by Mr. Knight from the blossom of the autumn bergamot, dusted with pollen of the St. Germain.

The Ellow cherry was produced by Mr. Knight from the pollen of the white heart and the blossom of the graffion. The black eagle he obtained from the graffion and the May-duke. The Waterloo and early black cherry were produced in the same manner. All these are great improvements.

The cranberry of America is a useful addition to our hardy fruit. It flourishes most in a damp situation, or near water. In currants nothing exceeds the large Dutch white and Champagne, an intermediate currant between red and white, but larger and more juicy than the red. Gooseberries have been considerably improved in Lancashire. The woodhall is a new variety of nectarine, raised by Mr. Henderson, near Holyton, in Scotland. The tree shews not the symptoms of mildew. The blossom is small, early, and hardy.

In the orangery, large trees are not now so frequently found as formerly. The citron and the lemon are preferred for training on trellises, or for covering the back wall of a hot-house. The Malta or sweet Phillipine orange have been introduced at no very distant period. It is of a beautiful round shape, reddish-yellow rind, and crimson juice. The fruit is small.

Peaches have been successfully cultivated by Mr. Knight. He planted several trees in large pots, and paid every attention to bringing them to a state of high health; he then applied to the pistil of one good kind the antheræ of another; each tree was allowed to bring not more than three peaches to perfection, and thus he produced the Acton and Spring Grove peach, both of a beautiful bright colour, and firm, but melting-vinous pulp. Braddick's American peach is recommended in the London Horticultural Transactions, vol. ii. It is a large yellow fruit, red next the sun; the pulp yellow and of high flavour. It is not, however, hardy, nor does the tree freely produce.

Mr. Hooker has described Wilmot's early Orlean's plum, in the third volume of the London Horticultural Transactions. It resembles generally the common Orleans, but it ripens three weeks earlier, while the blossom expands later than in almost any of the plum tribe. The fruit is particularly juicy, and of fine flavour, and the tree is vigorous and fertile. Coe's golden drop is also a new variety. The leaves are uncommonly large, which is the principal character of the variety. When the "fruit is ripe, the pulp is of a golden colour; it is dotted next the sun with violet and crimson. The fruit may be kept for many weeks hung up in a dry place. The trees require a west wall."

In the operations of the nursery Mr. Knight is still a prominent improver. In his treatise on the apple and pear, he notices the fact, that some of the finest cider and perry fruits of the seventeenth century have become extinct, and observes, that as each variety of fruit springs from an individual at first, it is by means of grafting or budding, that that individual has been extended. Whatever tendency to decay and extinction existed in the individual at first, must, he remarks, exist in the extensions of it, accomplished by buds or grafts. By careful management, and fortunate situation, the health and existence of a particular original tree may, however, be prolonged; and in like manner some buds or grafts, placed on vigorous stocks, and nursed in favourable situations, may long survive the other buds or grafts from the same tree, or may long survive the original ungrafted tree. Still there is in all of them a progress to extinction, so that the only reproduction of them is by seed. The great consideration comes then to be, the procuring of promising seeds. Mr. Knight prepared stocks of the best kinds of apple

capable of being propagated by cuttings, and planted these stocks against a wall in a rich soil; these were next year grafted with the golden pippin. In the course of the following winter, the young trees were raised from the ground, and, the roots being shortened, they were replanted. By this means they were brought into a bearing state at the end of two seasons. Only two apples were allowed to remain on each tree; these, consequently attaining a large size and perfect maturity, furnished the seed which was sown to procure seedlings allied to the golden pippin.

Mr. Knight, and some others, have been at great pains to bring the pollen of one kind of approved fruit in contact with the pistils of others, which is an operation of niccty. He opened the unexpanded blossom of the variety destined to be the female parent of the new progeny, and with a pair of small pointed scissors cut away all the stamina while the anthers were yet unripe, taking care to leave the style and stigmata uninjured. The full-blown blossoms of the other variety were afterwards applied. The fruits resulting from such artificial impregnation have been of the most promising character. He has often remarked in the progeny a strong prevalence of the constitution and habits of the female parent. In this country, therefore, in experimenting on pears, the pollen of the more delicate French kinds, as the crasane and chaumontelle, should be dusted upon the flowers (always deprived of stamina) of the muirfowl egg, the gray achan, the green yair, and others that are hardy, or of British origin. By these means, it is to be hoped, that in the course of time excellent winter pears may be obtained, for of such we are at present very deficient.

Mr. Knight, observing how slow some trees, as the mulberry and walnut, are in bearing, has ascertained that if scions be taken from prolific branches of bearing trees, the result will be that these may be made to anticipate the course of nature many years. If the stocks be planted in pots, and grafted by approach, they will generally afford fruit in three years. In training young trees of the peach and pear kinds, his plants are headed down as usual, a year after being grafted, two shoots only are allowed to each stem, and these are trained to an elevation of about five degrees. A branch trained upright, grows much more luxuriantly than one confined to an horizontal position. Advantage is taken of this law of vegetation; the stronger is depressed, and the weaker elevated. All lateral shoots are carefully removed. Next season, as many branches are encouraged as can be laid in without overshading each other; and care is taken in the spring to select the strongest and earliest buds near the termination of the year-old branches, to be trained lowest, and the weakest and latest buds near the base of the branches, to be trained inclining upwards; and the result is, that at the end of the season, each annual shoot comes to be nearly of equal vigour. In the following winter, half of the shoots are shortened, and the other half left at full length, one shoot being left, and the other cut alternately. In the third year, the central part of a peach tree will consist of bearing wood. The size and general health, and the equality of vigour of every part of young trees trained by these rules, evince a very regular distribution of sap; the rules at any rate are simple and of easy observance. Such trees, as they advance, are trained in the fan mode, always preferable where the walls are of a sufficient height.

It has been found to promote the growth of fruit to head downwards the extreme branches of the trees in training. It checks the tendency to produce wood. It is also a modern practice to conduct the extreme branches of fruit trees from one side of a wall to the other. The roots of the May-duke cherry, and some others, require to be in a cool soil. On the north side of a wall, therefore, such trees thrive best; but it has been found, that if their extreme branches be turned over the wall, and trained downwards on the south side, they are not only brought into plentiful bearing, but yield their fruit earlier.

Decorticating, or cleansing the skins of trees by stripping off the bark and washing them, has long been practised. Simple instruments have been invented for facilitating the removal of the bark. Some have recommended the operation to be applied even to young and bearing trees, and not merely in case of the bark appearing diseased or insect-eaten.

In conclusion, let us state that although we are aware that these and many other modern improvements are fully understood by all enlightened horticulturists, yet there are not a few of our readers who may not be acquainted with the advancement which the art is constantly and regularly making, while others may be led by the hints which the improvements here noticed furnish, to experiments on their own account, or at least to perceive the nature of the scope which the study presents to the ingenious and skilful.

## CHESHIRE.

One of the western counties of England; it is divided from Lancashire by the rivers Mersey and Tame; from Derbyshire and Staffordshire by the rivers Goyt and Dane, and a range of hills; and from Flintshire and Denbighshire in a great measure by the river Dee and its estuary, a small portion of the hundred of Broxton, lying to the west of this general boundary. The greatest breadth of this county from north to south is about thirty miles; its greatest length is fifty-eight miles. But its form is singular, being distinguished by two points projecting, one into the Irish sea, the other running up towards Yorkshire. If these were cut off, the figure of Cheshire would approach that of an oval, and its length be greatly reduced.

Cheshire contains one city, which is also the county town, Chester; seven hundreds, thirteen market towns, including the capital, and eighty-six parishes. It is a county palatine, and is not included in any of the circuits, having a chief justice of its own. The area of Cheshire comprises 1200 square miles, or 676,600 acres, of which a much larger proportion is in cultivation than in most other English counties. The general character of the surface is flatness. There is not much variety of soil; sand and clay, with the one or the other predominating in various proportions, constitute nearly the whole surface of Cheshire. The most prevalent subsoils are marl, clay, and red grit or sandstone. When viewed from a height, this county appears covered with wood; but this appearance arises from the smallness of the enclosures, and the great number of large trees in the hedge rows; otherwise it is not a well-wooded county.

The principal rivers are the Dee, the Weaver, the Dane, and the Tame: the Mersey, though frequently described as a Cheshire river, seems more properly to belong to Lancashire. The Dee is navigable for barges from Bangor Bridge; at Chester Bridge it meets the tide; at Chester, a ledge of rocks runs across the bed of the river; from this place to the sea its natural course forms a broad sandy estuary; but an artificial channel has been formed at great expense on the south side of the river, nearly half way to the sea, which is navigable for ships of six hundred tons burden. Cheshire is intersected by the Duke of Bridgewater's Canal, the Ellesmere, the Grand Trunk, the Chester, and Nantwich, and the Peake Forest. The mineral productions of the county are coal, copper, lead, cobalt, and rock-salt. As the rock-salt and the brine springs are naturally connected, and are found in the same districts, they may advantageously be considered together. The brine-springs are principally met with in the valley through which the Weaver and the Wheelock flow; and those from which salt is at present manufactured are at Lawton, Wheelock, Roughwood, in the townships of Anderton, Beckton, Leftwich, Middlewich, and in the neighbourhood of Northwich and Winsford. The brine is rich, but varies in strength; the strongest of these springs are at Anderton, while those at Leftwich are the weakest. The brine-springs at Wheelock are at the depth of sixty yards.

These springs were probably known to the ancient Britons. It is certain that salt made from them was one of the principal articles of the commerce of this county before the Norman conquest. The discovery of the rock-salt, on the other hand, was not made till 1670, during a search for coal near Northwich. Since that period it has been found abundantly in the townships of Wilton, Wincham, and Marston. The rock-salt is met with at various depths below the surface, from twenty-eight to forty-eight yards: some of the strata are only four feet thick, and others forty yards. In the mines near Northwich there are only two beds of rock-salt; but in other parts three beds have been found. These beds are divided from one another by strata of indurated clay or hard flag-stone, in which there are frequently found pieces of rock-salt. The muriate of soda, in the great body of the rock-salt, is mixed with a considerable portion of clay, oxide of iron, and sulphate of lime. In the lower strata the rock-salt is a purer muriate of soda. The rock-salt is extremely hard, and in many places requires to be blasted with gunpowder. The largest mine at present worked is that of Wilton; its depth is 330 feet, and its area nearly two acres; the ceiling, which is about twenty feet high, is supported by pillars fifteen feet thick, each containing 294 solid yards of rock-salt. Fifty or sixty thousand tons of it are obtained annually from the pits in the neighbourhood of Northwich, which is the great seat of the salt trade in the county. One third of the rock-salt is dissolved in water, and crystallized by evaporation; and two-thirds are exported in its native state.

The cotton manufactures of Lancashire have extended into the contiguous parts of Cheshire, particularly at Stockport. Silk is manufactured at Macclesfield and Congleton, where there are large silk mills; hats are made at Stockport, white and red lead at Chester; and gunpowder at Tholwall; tanneries are numerous, and on a large scale, in the middle and north of the county.

Landed property is in general very little divided in this county; and with respect to its agriculture it is almost entirely in the diary department. In former periods, Cheshire was much celebrated for its produce in wheat; but in later times it is chiefly noted for its cheese. Strabo and Pliny affirm, that the art of cheese-making was introduced into it by the Romans; but this is improbable from various circumstances; and we are certain that the Roman armies on the continent received a great quantity of cheese from this county, soon after they had secured possession of it. The quality and flavour of Cheshire cheese are well known. The following are some of the principal particulars as to the mode of its manufacture. In a dairy farm of 100 acres, from ten to fourteen acres are under oats; from six to eight are occupied with fallow-wheat. and the like quantity is laid out in summer fallow; the remainder being appropriated to pasture and hay; the amount of the latter is about twelve acres. The judicious dairy farmer is very scrupulous in the breeding and rearing of calves, and in the management of his cows, during summer and winter. The quantity of cheese made annually from each cow varies from 50 to 500 or more pounds; the produce depending, of course, in a considerable degree, on the nature of the land, the quality of the pasture, and the mode of wintering. In general, the average may be stated at about three hundred pounds. The quantity of milk, according to this calculation, yielded daily by each cow, is about eight quarts, which is commonly supposed to produce one pound (sixteen ounces) of cheese. The Cheshire cheese is generally made with two meals of milk; yet often towards the latter end of the season with four, five, or six milkings, the cheeses being usually very large. The most common size is sixty pounds; a weight susceptible of every excellence to be found in the cheese of this county. Of those large cheeses, two are made in some of the dairies daily. The evening's milk being preserved till next morning, it is skimmed, heated, and incorporated with the new milk, when the whole, together with the cream, being mixed in a large tub, and the proper quantity of rennet and colouring being added, it is left for about an hour and a half to coagulate. When this has taken place, the curd is broken into very small particles, which are left to subside, and the whey is nearly expelled. Then the curd is placed in a vat, and occasionally sprinkled with salt, of which some dairy women use about three handfulls to a cheese, making it a rule to put the greatest quantity near the middle. The vat is filled very full, and the whey repeatedly squeezed out, before it is placed in the press, as it is very material to expel all the whey, keeping the vat at the same time full of curds. The cheese is commonly taken twice or thrice from the vat, to place fresh cloths, pare off the edges, and turn it; and sometimes it is immersed in hot whey, which is supposed to harden its coat. After remaining in the press two or three days, it is conveyed to the salting house, where it is put in a salting tub, in which, having continued for about three days more, it is next placed on the benches for about eight days, being well salted all over, and turned every day. Then it is washed in warm water, wiped dry with a cloth, and when dry, smeared over with whey butter, and placed in the warmest part of the cheese-room, where it is left to acquire the proper age and consistence.

The number of cows kept for the dairy is about 32,000, and the quantity of cheese annually made in Cheshire is about 11,500 tons.

This county has made much progress in improvement of late years. The most important point in this improvement has been the introduction of green crops, alternately with corn, into the course of tillage; the irrigation of meadows is also a more general practice than formerly. The consequences of these measures it is needless to name, since their value must be at once plain to every one who considers the nature of a dairy farm. It is only surprising that such eminently beneficial management has not been universally followed up.

In this county there occur various examples of the most splendid scenery, as well as numerous brilliant prospects. More rain, it is said, falls here, than on the same extent of surface in any other part of the kingdom—Westmoreland and Lancashire only excepted. The climate, however, is temperate and mild. In 1811, the population was 227,031; in 1821, it was 270,098; and in 1831, it was 334,410.

## THE FARMERS AND WASTE LANDS IN IRELAND.

In a forcible and judicious volume lately published, under the significant title of "Instruct; Employ; Don't Hang Them," written by John Pitt Kennedy, late an officer in the corps of Royal Engineers, there is a sad picture given of the state of agriculture in many parts of Ireland, and a system explained and urged, whereby not only this deficiency and inferiority may be remedied, but by which the condition of the author's countrymen may be wonderfully bettered, and tranquillity restored throughout the island. This simple and profitable remedy consists in teaching the people an enlightened style of farming, and in giving to them, under certain conditions, the waste lands to cultivate, which in Ireland are of immense extent. He states that the great mass of the Irish people, amounting to forty-five out of every forty-six, are dependent directly and indirectly upon agriculture, and that yet, where almost all are agriculturists, almost all are ignorant of agriculture. In this condition of things, he strongly recommends a system of cheap, rational instruction, which would combine agricultural industry with letters, and which he has experimentally tried, as explained in part in the following quotation.

"With the chief causes of distress dwelt upon in the preceding chapter strongly impressed upon my mind, I attended a farming meeting in Londonderry, in the spring of 1834; and hoping to find others ready to move with me, whether as co-adjutors or competitors, in taking active measures to remove, as far as their means extended, that famine-spreading ignorance in agriculture, of which all admit the existence; I gave

a public challenge to land proprietors and others of the northern counties in Ireland, to shew, within twelve months from that date, the district school, which should be most generally and practically applicable to the circumstances of the country, combining literary and agricultural instruction. The challenge remained unanswered, hut probably not unridiculed ; and I proceeded in the formation of my school. It was clear, that to render the establishment contemplated extensively applicable and efficient, it must be based upon economy, and must be capable of hinging on to some general system already existing, in order that it might become a department of government, and be as little as possible dcpendant upon disinterested individual exertion, which experience has proved to be a quality rarely exhibited by the rich in Ireland. The new national school establishment appeared to offer many facilities to aid the accomplishment of this desirable object. The fairness of its original principle, with regard to sectarian points, was rapidly overcoming all opposition to its extension. It contemplated the placing of steady moral men throughout the whole country, at short distances from each other, receiving an adequate support, and whose time would not be more than half occupied by their schools ; the usual hours of instruction being from ten until two or three o'clock.

" I therefore determined to try the establishment of a national school in my district, the teacher of which, in addition to the ordinary qualifications of a parish schoolmaster, should possess a knowledge of the most approved system of agriculture. I determined to give to this teacher four acres of land, which it would be his business to cultivate as a model farm by means of his boys, formed into working classes after the hours of in-door instruction. The limited quantity of four acres was fixed upon, bccause it affords as perfect an opportunity to exhibit the detail of treatment, and the regular succession of crops, as the largest farm could afford, without occupying, by its extent, too much of the teacher's time. Its small size is further advantageous, because the average farms throughout the country are small, and because pupils or visitors can with ease compare at one view the difference of the treatment, and the relative proportion of land assigned in the rotation to each kind of produce.

" In March, 1834, I provided myself with a teacher of the above description, ensuring to him a salary of thirty pounds a year, in addition to his house and four acres of land, and combining his personal interest likewise with the efficient management of the school, by giving him the chance of an increase beyond this sum, dependant upon his success. A portion of this salary is to be paid by the Education Board, a portion by the pupils, as in ordinary national schools, and I am bound to make up any deficiency.

" My agrcement with the teacher, as to in-door instruction, is, that the regulations of the Education Board shall be strictly observed; and with regard to out-of-door or agricultural instruction, he is, after school hours, to direct working classes of the boys upon the small model farm, under sueh regulations as he shall from time to time receive from the patron of the school. He is to adopt the most approved system of tillage, as regards succession of crops. He is to house-feed and not to pasture his stock, of which he must, at all times, have at least one cow. It is part of his duty to give advice and explanation of details to the neighbouring farmers, to induce them to follow his example ; and he is to shew them how they should commence operations with which they are unacquainted. He is bound to open his school in the evening, to instruct adults who cannot quit their labour during the working hours. After a year's experience of this plan, the success of it has proved so completc, and the important out-of-door instruction given to the parents has required so much of the teacher's time, that I have given him an in-door assistant. It has been necessary to act very cautiously, and not encroach upon the regular school time, to avoid alarming the Education Board ; and also to avoid raising the suspicion of the parents, who would readily imagine that my object was to get work out of their children, rather than to convey useful instruction. If such checks did not exist, the school could be materially improved ; but it is vastly more important to suit it to the prejudices likely to retard its general adoption as a system, than to make one solitary school a little more perfect. As yet, therefore, the national school hours are not interfered with ; and I rest for the present satisfied with the attendance of such boys as are willing to work or obtain instruction upon the farm, for an hour each day, after school closes.

" Whilst the school-house was preparing, the master applied himself to the agricultural objects of his employment exclusively, and certainly with a success beyond what had been anticipated. I did not suppose that people would change the system of their forefathers, however erroneous it might be in fact, until positive and repeated proofs had been given to them of somc other being more beneficial. Yet in this case, some of the poorest, and of those considered likely to be least tractable, were found to take advantage during the first year of the advice, when supported by the practical assistance of the teacher, before they had time to witness the results produced on the model farm. This was highly satisfactory, and is an answer to those who would attribute consequences arising out of their own negligence and vices to the obstinacy and opposition of the poor. The fact is, the poor know their own plan, and they can know no other, until it is brought practically before their eyes. They cannot afford to make experiments. A failure to them would be ruin. They would be mad, were they to sow turnips, clover, or any other desirable crops, merely because their landlord or his agent, in taking a yearly gallop through the estate, tells them they ought to do so, without telling them how, and without explaining and exhibiting an infinity of details—details upon which the whole success must depend, and of which they are perfectly ignorant. Yet these gentlemen think, that in giving their galloping advice, they have done, not their duty to their tenants, because their only duty they conceive to be the exaction of rent, but they think that they have done all that wise, humane, and condescending landlords and agents could be expected to do; and they drive back to London, Paris, Rome, or God knows where, libelling their unfortunate dependants, and storming at their obstinacy, folly, and ignorance.

The author has several hundred acres of waste land under his control, and has allotted to a certain number of poor tenants, portions of it, influenced by the following considerations :—

" First—The poverty of the class of people who usually seek such farms.

" Second—The difficulty and unproductiveness of the enterprize at the commcncement.

" Third—That the applicants are, for the most part, unprovided with the ordinary farm requisites, and must obtain them out of the profits of their labour.

" Fourth—That their means would be gradually improving if they were discreetly managed.

" Fifth—That rent ought to be that portion of the produce which remains after deducting all expenscs of cultivation, taxes, &c., and a due remuneration to the farmer.

" Having given the relative value to these considerations, it was clear that a reclaiming tenant ordinarily circumstanced could not well afford to pay any rent during the first seven years, after which he might be charged a small, and gradually increasing rent. My bargain, therefore, was, that they should have a lease for twenty-one years, on the terms of reclaiming one acre each year, and bolding for the first seven years rent free ; the eighth year paying one shilling an acre ; the ninth year two shillings an acre ; the tenth, three ; and so on, increasing a shilling an acre every year till the end of the lease. The six tenants brought in by the former agent readily agreed to this arrangement, understanding that the small sums they had already paid in rent should be restored to them to invest in improvements. They were all, except one, of the poorest description

of people. They have received no assistance whatever from me, and have all perfectly succeeded. The first operation of each of these settlers was, to construct a temporary sod hut, about fourteen feet long by ten fect wide, which cost the occupiers about eight days' labour in construction, besides an outlay of 7*s*. 6*d*. for roofing timber, 6*s*. worth of thatch, and about 3*s*. for a door; making the whole average outlay for building the house, including the value of the occupiers' labour, and all materials used, 1*l*. 2*s*. 6*d*. A still smaller kind of hut was constructed at so low a cost as 7*s*. 6*d*., by our celebrated local architect, William Cartan; and the fact that human beings are to be found willing to live in such a habitation, and undertake the laborious enterprize of reclaiming bog as an improvement upon their former means of living, says much for the industry, the fortitude, and the misery of the people; but little for either the government or the rich class, who have neglected to turn so much patient energy to beneficial account. Having made their temporary huts, the settlers commenced working at their land; got a good deal of draining done, and prepared an acre or more, for potatoes, with lime, ashes, and a coating of clay;—they thus secured some food for the future. The second year, another acre was prepared for potatoes, as the first, and the acre of the previous year was sown with oats; and thus they proceeded for the third, fourth, and fifth years, adding, some an acre yearly, and some less, to the productive portion of their land, collecting materials for building at the same time; so that those who have completed their sixth year, have brought a large piece of land to a productive state, and have built permanent stone houses—in short, a gradual but certain improvement of their condition has been going on, from the first day of their settlement. Their success appears to have been mainly secured by the encouraging nature of their bargain, at the early period of their lease, when their difficulties are great, and their means small. To require rent at the commencement, would inevitably retard their progress, if not altogether crush their exertions; nor would the same amount of rent be advisable, during any two like portions of their lease, as their means of paying rent would not be the same during any two years."

The success of these tenants has already afforded conclusive proof of the facility with which the unemployed Irish labourers may be provided for, by settling them on waste lands, and that this can be effected to a great extent, without incurring any cost. It is to be hoped, that Mr. Kennedy's example will be followed by other proprietors. His volume we cannot doubt will greatly tend to forward this result. Another extract will enable our readers more fully to appreciate the value of his suggestions.

"I have reason to hope that there is one of my neighbours about to adopt the plan for improving his property, as above detailed; but the great proprietors, whose lands lie in all directions around me, do nothing. They are probably too full of riches and power to feel the necessity of being useful either to themselves or to others. They have looked on their country's agonies without making a single exertion for their removal, whilst they possess means which, if well applied, would have caused those agonies in a great measure to cease, and would at the same time have enormously increased their own powers of *self-indulgence*. The waste land of four individuals alone in Derry, Donegal and Tyrone, Lord Conyngham, Lord Abercorn, Mr. Murray, and Mr. Ogilby, I have heard estimated at 300,000 acres, and much of it is of the finest quality. Would that such men could be brought to comprehend the terrific effect of their inconceivable neglect in this essential point—would that the ablest Irishman of the present day, Mr. O'Connell, were to adopt the subject, and to give to it the support of his irresistible abilities, we should ere long be in the possession of internal peace and plenty, without a parallel in Europe.

"Those men who maintain that we have not the means to improve our condition in Ireland without external help, and who urge the doctrine that every thing must be done with 'capital,' and that nothing can be done without capital, would do well to reflect. They would find that we have capital, which we are satisfied to waste instead of employ. They would see that the light of heaven, the barren waste, and the *superabundant population* are capital—that the food which the pauper consumes is capital, come from whence it may; and if they calculated accurately, they would find, that even the last-mentioned capital which the pauper necessarily possesses, is sufficient to enable him to better his condition in life, and to relieve his neighbours from the burden of supporting him, provided he be but permitted to consume it whilst exercising a productive occupation; which we have the power of supplying, and thus make his food a reproductive investment, instead of forcing him to consume it in unproductive idleness. They would find that Ireland affords the most palpable opportunity of employing the energies of the poor to a very great extent, without further cost to any one, but with immense advantage to both poor and rich. Here it is that a most happy coincidence exists between the wants of Ireland and the means applicable for their relief. Experience goes the length of proving, that a bog proprietor without the command of a shilling, and an absolute pauper, by their mere co-operation, find that they possess capital, and capital sufficient to effect an enterprize, in its nature more certain, in its results more profitable, than any of those numerous popular speculations that we daily see leading the knowing world in the pursuit of riches.

"There is no mere speculation here advocated, but a certain profitable enterprize, into which chance does not enter. We shall take for example a pauper, provided with a wife and twelve children—a sufficiently good stock in trade for an Irish beggarman; we shall see how this itinerant-tax collector conducts his *menage*, forced to act as he does by circumstances which he cannot control, although others could; and we shall compare this state with the manner in which he would be inclined to act if he were permitted. At present, having no fixed residence, he marshals his family by the side of some road, and proceeds to divide them into the proper begging squads, giving to the mother charge of one, to the eldest daughter a second, and perhaps to the second daughter a third; assigning to each her foraging ground, and fixing a general rendezvous in the neighbourhood of some approaching fair, where his presence, supported by his eldest 'boy,' is required to *quell the peace*, and to establish upon *physical principles* the position and dignity of some belligerent clan or political party. He must not form one of his own tax-collectors; his presence would do infinite mischief, and would afford to the rich the opportunity of saying, 'you are a strong fellow; why don't you work?' to which address he could reply by a simple point of the finger to the great man's nearest waste. But Paddy is too sharp to venture such an answer—it would interfere with the future collections of his family; he therefore keeps out of the way, and amuses himself as he best can at wakes, fairs, and such other places as offer the chance of a fight or a frolic. He thus passes his mischievous life in a succession of drunken riots, living upon means supplied by the public, and collected for him by his wandering family, who, like himself, pass a laborious life in vice and misery, without producing a particle that they consume; suffering themselves and increasing the sufferings of others.

"But suppose that the rich man who tells the beggar 'he is strong,' and asks him 'why he does not work,' were to say—'there are ten, fifteen, or twenty acres of my waste land, which is producing nothing—if you think you can cultivate them, do so, and pay me a just return for the use of my land.'—Suppose that either the rich man, or the poor bog proprietor without a shilling in his pocket, were to speak so: the poor beggarman would have a hut built which he could call a home, before the end of the third day. He would allow his family to go on levying supplies as usual, but would himself become a productive labourer instead of a night-walking white foot. His first year's labour would furnish some food for his family for the second year, during which, the foraging excursions would be reduced to a portion, instead of the whole of the year; and the third year, the increase of farm produce would probably cause these excur-

sions to cease altogether. The only capital that is indispensable to a poor man commencing to reclaim, in addition to his spade, is food; a capital which he must possess whilst idling, or else die. His existence, therefore, is the proof that he does possess it, and it is sufficient; because, the labour wanted is spade labour, and the first manures he requires are such as his own labour can for the most part supply—lime and ashes. Animal manure he can likewise obtain, by taking charge of a grazer to feed upon his waste land, until he is able to provide himself with a cow of his own; or, if he should despair of being able to purchase a cow, he will soon save the price of a calf, which will in time become a cow."

## ON HOPS.

Hops are said to have been brought into this country from the Netherlands in the year 1524. In James the First's time they were abundantly cultivated in England. The richest and strongest ground is considered the most proper for them, especially if it be rocky within a few feet of the surface. Stiff clay or spongy wet land suit them badly. In Kent, new land is esteemed the best for this sort of crop; they also plant their hop-gardens with apple trees at a considerable distance from one another, and cherry trees between; and when the land has done its best for hops, which is reckoned to be in about ten years, the trees may begin to bear. The cherry trees last about thirty years, and by the time the apple trees are large, they cut down the cherries. In Essex, a moory land is considered the best for hops. Ground that inclines to the south or west is the most eligible exposure for such a crop; if it be to the north-east or south-west, there should be a shelter of some trees at a distance, to protect the shoots in spring from the nipping winds that prevail in these directions. The south-west winds also frequently break down the poles at the end of summer and damage the hops. In winter, soil and manure should be provided for the hop ground, to be applied in spring. When the dung is rotten, mix it with two or three parts of earth, and let it incorporate together till there be occasion to use it in making the hop hills; but if it be new dung, then let it be mixed, as before, till the spring in the next year, new dung being injurious to hops. Dung of all sorts was formerly more commonly used than it is now, especially when rotted and turned to mould, and they who have no other manure must take it. But hops delight most in that which is cool and moist.

Hops require to be *planted* in a situation so open as that the air may freely pass round and between them to dry up and dissipate moisture, whereby they will not be so subject to fire-blasts, which often destroy the middle of large plantations, while the outsides remain unhurt. The preparation of the ground for planting should take place in the preceding winter. After it has been ploughed and harrowed even, lay upon it in heaps a good quantity of fresh rich earth, and well rotted dung together, sufficient to put half a bushel in every hole to plant the hops in, unless the ground be naturally very fresh and good. The hills, where the hops are to be planted, should be eight or nine feet asunder, that there may be a free circulation of air between them; for in close plantations they are very subject to what the hop-planters term the fire-blast. If the ground is intended to be ploughed with horses between the hills, it will be best to plant them in squares chequer-wise; but if it be so small that it may be done with the breast-plough or spade, the holes should be ranged in a quincunx form. Which way soever is adopted, a stake should be stuck down at all the places where the hills are to be made. Great caution is requisite in the choice of the plants, as to the kind of hop; for if the hop-garden be planted with a mixture of several sorts that ripen at different times, it will cause a great deal of loss and trouble. The two best sorts are the white and the gray bind; the latter is a large square hop, more hardy, and is a more plentiful bearer, and ripens later than the former. There is another sort of the white bind, which ripens a week or ten days before the common; but this is tenderer, and a less plentiful bearer; it has this advantage, however, that it comes first to market. But if these grounds, or three distant parts of one ground, be planted with these three sorts, they may be picked successively as they become ripe. The sets should be five or six inches long, with three or more joints on them. If there be a sort of hop that is particularly valued, the superfluous binds may be laid down when the hops are tied, cutting off the tops, and burying them in the hill; or when the hops are dressed, all the cuttings may be saved; for almost every part will grow, and become a good set next spring. The Kentish planters prefer the months of October and March, as the seasons for planting, both which sometimes succeed very well; but the sets are not to be had in October, unless from some ground that is to be destroyed; and likewise there is some danger that the sets may be rotted, if the winter prove very wet; therefore the most usual time of procuring them is in March, when the hops are cut and dressed. There should generally be five good sets planted in every hill, one in the middle, and the rest round about sloping, the tops meeting in the centre; they must stand even with the surface of the ground; let them be pressed close with the hand, and covered with fine earth, and a stick should be placed on each side the hill to secure it. The ground being thus planted, all that is to be done more during that summer, is to keep the hills clear from weeds, and to dig up the ground about the month of May, and to raise a small hill round about the plants. In June the young bind or branches must be twisted together into a bunch or knot; for if they are tied up to small poles the first year, in order to have a few hops from them, it will not prevent the weakening of the plants. The compost or dung, if the weather be dry, should be laid on about Michaelmas, that the wheels may not cut the ground, or when there is hard frost. If it can be afforded, it should be spread in the alleys all over the ground, and dug in during the winter; forty loads an acre, thirty bushels to the load, will often be the quantity required. If you have not dung enough to cover all the ground in one year, a part may be manured in one year, and another in a second and a third. Those who have but a small quantity usually content themselves with laying on about twenty loads an acre every year, either about November or in the spring; which last some account the best time, when the hops are dressed, to cover them after they are cut; the manure in this case must be well rotted and fine.

As to the *dressing* of hops, let it be observed, when the ground is dug in January or February, that the earth about the hills, and very near them, ought to be taken away with a spade, that you may come the more conveniently at the stock to cut it. About the end of February, if the hops were planted the spring before, or if the ground be weak, they ought to be dressed in dry weather; but otherwise, if the ground be strong, and in perfection, the middle of March will be a good time; and the latter end of March, if it be apt to produce over-rank binds, or the beginning of April, may be soon enough. Then having with an iron picker cleaned away all the earth out of the hills, so as to clear the stock to the principal roots, with a sharp knife you must cut off all the shoots which grew up with the binds the last year; and also all the young suckers, that none may be left to run in the alley and weaken the hill. It will be proper to cut one part of the stock lower than the other, and also to cut that part low that was left highest the preceding year. By pursuing this method you may expect to have stronger buds, and also keep the hill in good order. In dressing those hops that have been planted the year before, the dead tops and the young suckers which have sprung up from the sets ought to be cut off, and the stocks covered with fine earth a finger's length in thickness.

The *poling* should take place about the middle of April, when the shoots begin to sprout up. The poles must be set to the hills deep into the ground, with a square iron picker or crow, that they may the better withstand the winds. Three poles are

sufficient for one hill. These should be placed as near the hill as may be, with their bending tops turned outwards from the hills to prevent the binds from entangling; and a space between the poles ought to be open to the south to admit the sun-beams. The poles ought to be in length sixteen or twenty feet, more or less, according as the ground is in strength; and great care must be taken not to overpole a young or weak ground, for that will draw the stock too much, and weaken it. If a ground be overpoled, a good crop is not to be expected from it; for the branches which bear the hops will grow very little till the binds have over-reached the poles. Two small poles are sufficient for young ground. By waiting till the sprouts or young buds are the length of a foot, the place where the largest poles are to be put, may be well seen, but staying till they fall into the alleys, is bad management, because they entangle one with another, and will not afterwards clasp readily round the pole. Maple or aspen poles are accounted the best, because of their warmth, or because the climbing of the hop is promoted by the roughness of the bark. But for durability, ashen or willow poles are preferable; chesnut poles are still more so. If, after the hops are grown up, any of them have been under-poled, taller ones may be placed nearer those that are too short, to receive the binds from them.

As to the *tying* of hops, the buds that do not clasp of themselves to the nearest pole when they are grown to three or four feet high, must be guided to it by the hand, turning them to the sun, whose course they will always follow. They must be tied with withered rushes, but not so close as to hinder them from climbing up the pole. This must be attended to till all the poles are furnished with binds, of which two or three are enough for a pole; and all the sprouts and binds that there are no occasion for are to be plucked up; yet if the ground be young, none of these should be plucked, but wrapt up together in the middle of the hill. When the binds are grown beyond the reach of your hands, if they forsake the poles a stand-ladder may be used, that they may be tied. Towards the latter end of May, when the tying process is over, the ground must have the summer dressing. This is done by casting up with the spade some fine earth into every hill; and a month after this is done, you must hoe the alleys with a Dutch hoe, and make the hills up to a convenient bigness.

About the middle of July hops begin to blow, and will be ready for *gathering* about Bartholomew Tide. A judgment may be formed of their ripeness by their strong scent, their hardness, and the brownish colour of their seed. When, by these tokens, they appear to be ripe, they must be picked with all the expedition possible; for if at this time a storm of wind should come, it would do them great damage by breaking the branches, and bruising the hops: it is well known that hops, picked green and bright, will sell for a third part more than those that are discoloured and brown. The most convenient way of picking them is into a long square frame of wood, called a *bin*, with a cloth hanging on tenter-hooks within it, to receive the hops. The frame is composed of four pieces of wood joined together, supported by four legs, with a prop at each end to bear up another long piece of wood placed at a convenient height over the middle of the bin; this serves to lay the poles upon which are to be picked. The bin is commonly eight feet long, and three feet broad; two poles may be laid on it at a time, and six or eight persons may work at it, three or four on each side. It is best to begin to pick the hops on the east or north-east side of your ground, if this can conveniently be done, to prevent the south-west wind from breaking into the garden. Having made choice of a spot of the ground containing eleven hills square, place the bin upon the hill which is in the centre, having five hills on each side; and when these hills are picked, remove the bin into another piece of ground of the same extent, and so proceed to the close. When the poles are drawn up to be picked, great care must be taken not to cut the binds too near the hills, especially when the hops are green, because it will make the sap to flow excessively. The hops must be picked clean, that is, free from leaves and stalks; and, as there shall be occasion, two or three times in a day the bin must be emptied into a hop-bag, made of coarse linen cloth, and carried immediately to the oast or kiln in order to be dried; for if they should be long in the bin or bag, they will be apt to heat and become discoloured. If the weather be hot, there should no more poles be drawn than can be picked in an hour, and they should be gathered in fair weather, if it can be done, and when the hops are dry. This will save some expense in firing, and preserve their colour better when they are dried. The crop of hops being thus bestowed, you are to take care of the poles against another year, which are best to be laid up in a shed, having first stripped off the haulm from them; but if you have not that convenience, set up three poles in the form of a triangle, or six poles, wide at bottom; and having set them into the ground with an iron picker, and bound them together at the top, set the rest of your poles about them; and being thus disposed, none but those on the outside will be subject to the injuries of the weather, for all the inner poles will be kept dry, unless at the top; whereas, if they were on the ground, they would receive more damage in a fortnight, than by standing all the year.

The best method of *drying* hops is with charcoal on an oast or kiln, covered with hair-cloth, of the same form and fashion that is used for dry malt. The kiln ought to be square, and may be of ten, twelve, fourteen, or sixteen feet over at the top, where the hops are laid, as your plantation requires, and your room will allow. There ought to be a due proportion between the various parts of the kiln. The hops must be spread even upon the oast a foot thick or more, if the depth of the curb will allow it; but if the hops be green or wet, particular care is required. There are a number of other minute matters to be observed in drying hops, that cannot well be explained, unless at much greater length than we have room for. The good sense of the hop-grower must always be extended to suit special cases.

The common method of *bagging* hops is, to have a hole made in an upper floor, either round or square, large enough to receive a hop-bag, which consists of four yards and a half of yard-wide cloth. A handfull of hops is tied in each lower corner of the bag, to serve as handles; and the mouth of it is fastened upon the edges of the hole. Then he that is to tread the hops does so on every side, as another person is continually putting them in; and when well filled and trodden, the bag is unfastened and let down—the mouth of it is closed and a handfull of hops tied in each corner, as was done in the lower part. But previous to this bagging, as soon as they are taken off the kiln, the hops must have been laid in a room, and kept there for three or four weeks, to cool, give, and toughen. Hops that have been thus treated and well packed, will keep good several years; but care must be taken that they be not destroyed by mice.

As to the various *uses* to which hops may be turned, beside the common one, it will be found, in the spring-time, while the bud is yet tender, that the tops of the plant, being cut off and boiled, may be eaten like asparagus; they are thus very wholesome. The heads and tendrils are also very good for purifying the blood in most cutaneous diseases, besides various other medical cases. But the principal use of hops is in the brewery for the preservation of malt liquors, which, by the superaddition of this balsamic, aperient, and diuretic bitter, become less viscid, less apt to turn sour, more detergent, and in general more salubrious. They are said to contain an agreeable odoriferous principle, which promotes the vinous fermentation. When slightly boiled or infused in warm water, they increase its spirituosity.

The *expense* of taking up hop-ground is from five to six pounds per acre; in certain cases a still greater sum must be laid out in this operation, to which may be added twenty-five pounds per acre for poles, before the ground has its full quantity. Then there must be calculated the rent and taxes, &c., and the working for three years, before many hops can be expected. A substantial building for a kiln cannot be erected for

a hundred pounds, if it has store-rooms necessary only for five acres. Indeed, there is scarcely any hop-ground but costs upwards of twelve pounds per acre (exclusive of the picking and duty, which may exceed twenty pounds per acre, or be very little); there are also other grounds in which upwards of twenty pounds per acre are annually expended, so that the average may be said to be about fifteen pounds, without the picking, drying, and duty.

This plant is extremely liable to disasters from its first putting up in the spring, until the time of picking, which is in September. Snails, slugs, ants, and fleas, are formidable enemies; also frosts and blights. Small green fleas, which appear in May and June, often greatly injure them; and then the high winds from the south-west are much to be feared also. One objection to the cultivation of such a crop is, that they require a great deal of dung, which in most cases can only be abstracted from the tillage-lands. On the other hand, it is admitted, that upon suitable soils, and under good management, they make a very profitable return. On such soils a hop plantation may continue for fifteen years or more, but commonly begins to fall off about the tenth year.

## THE POETRY OF FLOWERS AND TREES.

In a work on the "Poetry of Life," by Sarah Stickney, just published, there are two chapters devoted to flowers and trees. The whole work is ably executed, and in a delightful spirit, as our readers will readily believe from the extracts we are about to make from the portion of it which properly belongs to our department. By the Poetry of Trees and Flowers, is meant, that they suggest associations that are tender, refined, beautiful, and sublime, to the human mind, and ideas that are exclusively intellectual. There are few who do not experience poetic feelings in the contemplation of these natural objects; there are few who do not understand something of the oratory of flowers and trees. It has been beautifully said, that to the poetical mind, they are not mute to each other: to the pious, they are not mute to their Creator; and to man, they have a pleasing or affecting language. Rousseau wept on beholding the little common flower that we call periwinkle. He wept because he was alone, and it reminded him of the beloved friend at whose feet it had been gathered. A flower seasonably offered has been known to alleviate profound grief, at a moment when the most tuneful voice would have grated harshly on the ear, and when the stricken soul could be soothed only by unbroken silence. Who that is familiar with Wordsworth's verses, or Burns' Mountain Daisy, can deny that to the sensitive and imaginative mind, there is poetry in flowers? Or who, that reads the following extracts, will say that there is a flower, shrub, or tree, which from its loveliness, perfume, natural situation, uses, majesty, or classical association, is not highly poetic?

"As the welcome messenger of spring, the snowdrop, claims our first regard; and countless are the lays in which the praises of this little modest flower are sung. The contrast it presents of green and white (ever the most pleasing of contrasts to the human eye), may be one reason why mankind agree in their admiration of its simple beauties; but a far more powerful reason, is the delightful association by which it is connected with the idea of returning spring; the conviction that the vegetable world through the tedious winter months has not been dead but sleeping; and that long nights, fearful storms, and chilling blasts, have a limitation and a bound assigned them, and must in their appointed time give place to the fructifying and genial influence of spring. Perhaps we have murmured (for what is there in the ordinations of Providence at which man will not dare to murmur?) at the dreariness of winter. Perhaps we have felt the rough blast too piercing to accord with our artificial habits. Perhaps we have thought long of the melting of the snow that impeded our noonday walk. But it vanishes at last; and there, beneath its white coverlid, lies the delicate snowdrop, so pure and pale, so true an emblem of hope, and trust, and confidence, that it might teach a lesson to the desponding, and show the useless and inactive how invaluable are the stirrings of that energy that can work out its purpose in secret, and under oppression, and be ready in the fulness of time to make that purpose manifest and complete. The snowdrop teaches also another lesson. It marks out the progress of time. We cannot behold it without feeling that another spring has come, and immediately our thoughts recur to the events which have occurred since last its fairy bells were expanded. We think of those who were near and dear to us then. It is possible they may never be near again; it is equally possible they may be dear no longer. Memory is busy with the past; until anticipation takes up the chain of thought, and we conjure up, and at last shape out in characters of hope, a long succession of chances and changes to fill up the revolving seasons which must come and go before that little flower shall burst forth in its loveliness again. Happy is it for those who have so counted the cost of the coming year, that they shall not find at the end they have expended either hope or desire in fruitless speculations.

"It is of little consequence what flower comes next under consideration. A few specimens will serve the purpose of proving, that these lovely productions of nature are, in their general associations, highly poetical. The primrose is one upon which we dwell with pleasure proportioned to our taste for rural scenery, and the estimate we have previously formed of the advantages of a peaceful and secluded life. In connection with this flower, imagination pictures a thatched cottage standing on the slope of a hill, and a little woody dell, whose green banks are spangled all over with yellow stars, while a troop of rosy children are gambolling on the same bank, gathering the flowers, as we used to gather them ourselves, before the toils and struggles of mortal conflict had worn us down to what we are now; and thus presenting to the mind the combined ideas of natural enjoyment, innocence, and rural peace—the more vivid, because we can remember the time when something like this was mingled with the cup of which we drank—the more touching, because we doubt whether, if such pure drops were still there, they would not to our taste have lost their sweetness.

"The violet, while it pleases by its modest, retiring beauty, possesses the additional charm of the most exquisite of all perfumes, which, inhaled with the pure and invigorating breezes of spring, always brings back in remembrance a lively conception of that delightful season. Thus, in the language of poetry, 'the violet-scented gale' is synonymous with those accumulated and sweetly-blended gratifications which we derive from odours, flowers, and balmy breezes; and above all, from the contemplation of renovated nature, once more bursting forth into beauty and perfection.

"The jessamine, also, with its dark green leaves, and little silver stars, saluting us with its delicious scent through the open casement, and impregnating the whole atmosphere of the garden with its sweetness, has been sung and celebrated by so many poets, that our associations are with their numbers, rather than with any intrinsic quality in the flower itself. Indeed, whatever may have first established the rank of flowers in the poetical world, they have become to us like notes of music, passed on from lyre to lyre; and whenever a chord is thrilled with the harmony of song, these lovely images present themselves, neither unimpaired in their beauty, nor exhausted of their sweetness, for having been the medium of poetic feeling ever since the world began.

"It is impossible to expend a moment's thought upon the lily, without recurring to that memorable passage in the sacred volume: 'Consider the lilies of the field, how they grow. They toil not, neither do they spin, and yet I say unto you, that Solomon in all his glory was not arrayed like one of these.' From the little common flower called heart's ease, we turn to that well-known passage of Shakspeare, where the fairy king

so beautifully describes the 'little western flower.' And the forget-me-not has a thousand associations tender and touchiug, but unfortunately, like many other sweet things, rude hands have almost robbed it of its charm. Who can behold the pale Narcissus, standing by the silent brook, its stately form reflected in the glassy mirror, without losing themselves in that most fanciful of all poetical conceptions, in which the graceful youth is described as gazing upon his own beauty, until he becomes lost in admiration, and finally enamoured of himself: while hopeless echo sighs herself away into a sound, for the love, which, having centred in such an object, was neither to be bought by her caresses, nor won by her despair."

In a late number, we ourselves attempted to sketch some of the poetical allusions belonging to the qualities and appearance of the "lady rose," as poets have designated this queen of beauty, and therefore pass over our authoress's illustrations connected with it, that we may come to mark some distinctions in the character of different trees, and also a general agreement amongst mankind in the relative ideas connected with each particular species.

"It is scarcely necessary to repeat how essential to our notions of perfection is the beauty of *fitness*—that neither colour, form, nor symmetry, nor all combined in one object, can command our unqualified admiration without *adaptation;* and that the mind, by a sort of involuntary process, and frequently unconsciously to itself, takes note of the right application of means, and the relation of certain causes with their natural effects. Thus we admire the stately pine upon the mountain, not merely because the eye is gratified by a correspondence between its spiral form pointing upward towards the sky, and the high projecting pinnacles of rock, unbroken by the steps of time; but because we know that in consequence of this particular form, it is peculiarly adapted to sustain without injury the tempestuous gales which prevail in those inhospitable regions where it chiefly grows. There is something fierce, bristling, and defensive, in the very aspect of the pine; as if it set at nought the hollow roar of the tempest through its scanty foliage, and around its firm, unshaken stem, while it stands like a guardian of the mountain wilds, armed at all points, and proudly looking down upon the flight of the eagle, and the wreaths of wandering clouds that flit across the wilderness of untrodden snow. But plant a single pine upon the gentle slope of a green lawn, amongst lilachs, and laburnums, and tender flowering shrubs, the charm of association is broken, and the veteran of the rugged and mountainous waste is shorn of his honours; like a patriot chief, submitting himself to the polished chains of society at the court of his tyrant conqueror.

"The oak, the monarch of the woods, presents to the contemplative beholder innumerable associations by which his mind is plunged into the profound ideas of grandeur, spacc, and time. We are struck with the majestic form and character of this tree —the mass of its foliage, the depth and extent of its shadow, and the tremendous power of resistance bodied forth in its gnarled and twisted boughs; but above all other considerations connected with it, we are affected almost with reverence by the lapse of time required to bring those prodigious branches to perfection, and the many, many tides of human feeling that must ebb and flow, before those firmly knotted roots shall yield to the process of decay. In the natural course of meditation to which such a subject leads, we consider the striking truth, that while nations have bowed and trembled beneath successive tyrants, until by the wonted course of nature, the terrors of the oppressed have given place to the reckless desperation that works its way, by the overthrow of empires, the destruction of thrones, and the scattering of multitudes—while the laws and the religion of half the world have becn revolutionized, and what was once deemed a virtue has gradually become punishable as a crime—while sterile wastes have been reclaimed, and fertilized, and made fruitful, by the power and industry of successive gencrations of men, and arts and commerce have wrought wonders which our unsophisticated forefathers would have pronounced miraculous—the same oak has stood, perhaps at one time the witness of Druidical rites, at another affording shelter to the simple and unlettered peasant tending the herds of swine that fed upon its falling acorns: until, years rolling on, revolving summers crowning its brow with verdant beauty, and hoary winter scattering that beauty to the winds, have left it for our warning, an emblem of fallen majesty—its once sturdy boughs no sooner attacked by the worm of destruction within, than assailed, and torn, and broken by the merciless blast without.

"Striking and magnificent as the oak unquestionably is in its peculiar attitude and growth, presenting at one view the combined ideas of ability to resist the strong, and power to defend the weak, it is yet scarcely less majestic than beautiful. What a combination of gorgeous hues its autumnal foliage displays! The eye of the painter revels in its sombre glory, its burnished hue, and its wild fantastic garniture of green and gold, contrasted with its own hoary stem, and the depth of shadow that is thrown by the rays of the declining sun in lengthening gloom over the quiet earth.

"Nor is it merely with the outward aspect of this tree that our most powerful associations are connected. In a nation perpetually exulting in her maritime supremacy, we have learned to regard the oak as forming a sort of bulwark for the defence of our liberties. Thus the British sailor calls upon his comrades by the proud title of 'hearts of oak,' and England is not unfrequently described as being protected by her 'oaken walls.'

"There are, besides these, many other characters or points of consideration, in which we regard the oak with feelings of respect, and sometimes with poetical interest. Perhaps it is not least in the scale of importance, that many ancient and statcly apartments, dedicated to solemn or religious purposes, are lined with panels of the wood of this tree. The samc wood, beautifully carved and dcepened into gloomy magnificence by the sombre influence of time, forms one of the principal ornaments in many religious houses; and when we look back to the customs of our ancestors, and the station which they occupied, with that respect which we naturally feel for their boasted hospitality, good cheer, and substantial magnificence, we seldom fail to surround them, in imagination, with goodly wainscoting of oak, to place a log of the same wood upon the blazing hearth, and to endow them with powers both mental and bodily, firm, stable, and unbending as this sturdy tree."

The elm and the willow are equally well characterised, but to descend to shrubs, we shall find our poetical notions increase, in proportion as these are more picturesque, graceful, or parasitical.

"But above all other vegetable productions, neither trees nor flowers excepted, the ivy is perhaps the most poetical. And why? not merely because its leaves are 'never sere,' nor because it hangs in fanciful festoons, glittering yet gloomy, playful yet sad; but because it does what so few things in nature will do—it clings to, and beautifies the ruin—it shrinks not from the fallen column—it covers with its close embrace the rugged face of desolation, and conceals beneath its rich and shining mantle the ravages made by the hand of time—the wreck which the tempest has wrought.

"Besides this highly poetical idea, which forces itself upon every feeling mind, the ivy has other associations, deeply interesting in their character. It requires so many years to bring it to the perfection necessary for those masses of foliage, and dark recesses of mysterious gloom, which its most picturesque form presents, that we naturally connect with this plant the ideas of solemnity which are awakened by reflecting on the awful lapse of time. The ivy too is chiefly seen upon the walls of religious houses, either perfect or ruinous, where its heavy clusters of matted leaves, with their deep shadow, afford a shelter and a hiding place for the bat and the owl, and, in the ideas of the irrational or the too imaginative, for other less corporeal beings that flit about in the dusky hours of night. Thus the ivy acquires a character of mystery and gloom, perhaps even more poetical than that which strikes us when we see its glit-

tering sprays glancing in the clear light of day, or waving in the wind around the grey turrets of the ruin, and suggesting that simile which has been so frequently the poet's theme, of light words and jocund smiles assumed by the broken-hearted to conceal the withering of the blighted soul."

But when all the tenants of the forest, the field, and the grove, as well as those cultivated for domestic purposes, are considered individually, think but of the ever varying combination of form, colour, majesty, and grace, presented by the forest, or the woodland, the sloping banks of the river, or the leafy dell, with their feathery foliage trembling in the gale, and reflected again by the glassy neighbouring streams, and say, is there not here a world of perfect beauty and poetic associations to be found, through which the sensitive and imaginative behold what is hid from other eyes? It is by treating of the vegetable kingdom in this way, that one of the most refined and exalted of studies is to be pursued, and the world greatly benefited; and, according to this enlarged view, we have selected the beautiful reflections above quoted, from a writer of remarkable taste and acquirements.

## ACCOUNT OF THE MANGROVE TREE.

The Oriental Annual, just published, containing "Scenes in India," has the following account of the mangrove tree, which we have pleasure in copying, not merely because of its singular form and character, but of the beauty and felicity of the writer's descriptive powers.

"This singular tree is one of the most extraordinary productions of the vegetable kingdom. It grows to the height of from twenty to thirty feet, and is found chiefly on the margin of rivers not far from the sea, where its roots are nourished by the salt water. It is likewise found in low grounds overflowed by the sea. A great number of long lateral branches project on all sides from the trunk, to a great length. These are covered with clear glossy leaves, of an elliptical form, and nearly half a foot long. Nothing can well exceed the strange appearance which this tree presents on first beholding it. The roots seem like a coarse net-work upon the surface of the water, above which the trunk is elevated several feet from this. There branch out a number of flexible shoots, that take a circular direction downward, and continually intersecting each other, resemble a reticulated bower, which a prurient fancy might take to be the abode of dryads, hamadryads, and water-fairies. The interlacings of these shoots are sometimes so thick that nothing larger than a small reptile could pass between them. They are frequently covered with oysters; and it is no uncommon thing for the crews of boats to gather from these strange beds a generous meal of these crustaceous luxuries. The seed of the mangrove tree begins to germinate while the fruit in which it is enclosed is yet hanging from the branch. At the top of the cell that confines the seed a minute fibre gradually protrudes, to the length of ten or twelve inches. This process continues, in fact, until the weight of the mass separates it from the parent branch, and it falls vertically into the mud, the seed being disengaged from the cell in which it was enclosed; when the soft loom that covers it quickly excites the germinating principle. These trees frequently grow in such thick clusters as to form an impenetrable grove."

*Transactions of the London Horticultural Society.—Second Series.—Vol. I.*

The publication of the first volume of a new series of the London Horticultural Society's Transactions in the course of the present year calls for some notice from us. The contents of this volume impress us strongly with a conviction of the great services which the Society has conferred on the art to which it is devoted. And when we remember that it was founded in 1804, by a few private individuals, and that its charter was granted in 1809, we may well wonder at the work it has directly achieved, and the influence it has shed over the empire, as well as foreign parts. The Society maintains a connection and correspondence with almost every part of the United Kingdom, and also of the globe; and it is cherished not only by persons in the first rank of life, but supported by practical and scientific gentlemen of the highest note in the horticultural department.

The objects of this Society are decidedly practical. It takes under its care all the variety of produce which the garden can yield, as food or the means of enjoyment to man. The introduction of new vegetables and fruits, or the amelioration of those which are already in use, are its principal objects, while ornamental gardening is not forgotten. Botany and agriculture, in the proper sense of these words, are not discussed; but still they afford aid and illustration which are not rejected. In short, the garden of the Society, which has been established at Chiswick, or a sight of the volume before us, is more than sufficient to prove the vast extent of improvement, knowledge, and enterprize, which has been exhibited by this institution; and also to show, that while hitherto it has enrolled an immense number of celebrated names, as supporters and benefactors, it continues to merit a no less distinguished patronage, as being a source of national wealth, welfare, and fame.

To prove in part the claim which this Society has on public favour, we shall extract a few portions of its Transactions, as they appear in the volume lately published, endeavouring at the same time to present specimens of the variety of information and inquiry which the papers read before the Society contain. It is to be remembered, however, that the committee appointed to direct the publication of these papers, do not answer for the certainty of the facts, or the propriety of the reasonings contained in them, but ground their conduct in the work of selection, upon the importance and singularity of the subjects, or the advantageous manner in which the authors have treated them.

The paper which we first extract from, is by Thomas Andrew Knight, giving an account of an economical method of obtaining very early crops of new potatoes, which he has practised during the last two years. After stating that it is well known that this vegetable, when buried sufficiently deep in the soil to render it secure from frost, generally is very strong in the succeeding spring, he says, he was thence led to hope, that by planting in September large tubers, which had ripened early in the preceding summer, and had by a period of rest become excitable, he should be able to cause roots and stems to be emitted, to some extent, in the autumn; and that these, by being well defended through winter, might afford him an early produce. The experiment failed. The tubers vegetated almost immediately, and the stems just reached the surface, when they were destroyed by frost; and although the ground was immediately covered, not a single plant appeared in the following spring. It was on this account that Mr. Knight considered the experiment a failure.

Late the following summer, however, he observed that a very large number of rather strong potato plants rose through the soil, precisely where he had deposited the large tubers in the preceding autumn, which satisfied him that they had not perished. "The experiment was therefore repeated in the autumn of 1828; and the result in the succeeding spring was the same; not a single plant appearing above the soil; but upon examination I found beneath it, in June, a very abundant crop of excellent young potatoes, which attained maturity at least a month earlier than those raised at the same time, in the same soil and situation in the usual way. It now became obvious, that a similar crop of young potatoes had been produced in the preceding year; and that these having remained at rest till late in the summer, had become excitable, and had produced the numerous plants above mentioned. The tubers planted were of the largest size which I could obtain of the variety, the ash-leaved kidney potato.

"I am not prepared to say what weight of new potatoes may

be obtained from any given weight of old; but I have reason to think that the young will be equal to the weight of one-third at least of the old;" which will not be found expensive, comparatively with the usual price of new potatoes early in the season. Two early varieties only have been the subjects of Mr. Knight's experiments; but he does not see why similar success may not attend all other early kinds, if so treated.

Mr. James Corbett, in September, 1829, had a paper on the destruction of snails, in which he says, that he uses the same material that has been recommended by others, but never has it been used, he is sure, with better success than with him. "I discovered that it answered the intended purpose much best when it was applied in the night, and in different parts of the night. I began by sprinkling quicklime lightly over the beds and adjoining alleys and walks about ten o'clock at night, after a wet or very dewy evening, and I usually found a large number of snails, many of them exceedingly small, dead on the following morning; but some always escaped, and I suspected these to be of another species, which did not leave their hiding places so early in the evening as the others. I therefore tried the effect of sprinkling the lime over the same beds and walks about three o'clock in the morning; and by these means I, in a short time, ceased to be troubled with snails of any kind, in situations where they were before very abundant and destructive. The lime used should be fresh burned, and it should be sprinkled regularly, though lightly, not only over the ground, but over every plant in the vicinity." Mr. Corbett adds, that he has always found this method to succeed perfectly to his wishes; and, indeed, it carries with its simple announcement, strong probability and wisdom.

In these Transactions, and from the very origin of the Horticultural Society, we find Mr. Knight the most constant and practical member of it, perhaps, that has existed. In the very next paper to the one on the destruction of snails, we meet again with the indefatigable contributor above named, where he gives an account of a method of obtaining very early crops of green peas. This vegetable is sought after, when in its green state, early in the season, with uncommon anxiety; and at the same time it requires unusual labour to bring it forward at that period. Mr. Knight however, says, that he has found out how he could obtain an abundant crop at a much earlier period than he formerly thought possible, and at little expense or trouble.

As he never plants his melon seeds till the end of February, nor puts the plants into the beds or pots in which they are to remain till the end of March, he made a hot-bed in the middle of January, into which pots of about nine inches diameter were placed, at the distance of one foot from centre to centre.

"In each of these pots a couple of dozen peas were put in a circular row; and around them was planted a row of numerous slender twigs, one foot above the surface of the mould. Thus circumstanced, the pease grew very freely, and soon attached themselves, by means of their tendrils, firmly to their supports; and in the middle of March they had become fourteen inches high, and nearly in contact with the glass roof, which had been previously raised a little. They were then transferred to the open border, and some manure was given, and very numerous sticks were employed to afford them some degree of protection. This transplantation and removal from the pots did not appear to injure them in any degree; and in the end of March many of their blossoms were so far advanced, that they shed their pollen." A severe frost, and heavy fall of snow, he says, came on in the beginning of April, but these plants of sixteen inches growth were no more injured than those that were only four; and on the 26th of April they were at least three weeks earlier than any he had ever previously been able to raise. Mr. Knight therefore conceives that he raised an exceedingly early and valuable crop, without any loss of time to his melons, plants of which had been made ready to occupy the frames whence the pease had been taken. We do not learn, however, that he repeated the experiment, neither what was the produce of the one which he made. But many have the means of putting it to the test for themselves; and no doubt our abridgment of its author's account will induce some to do so, who might not have had access otherwise to the information.

Mr. Harrison, gardener to Lord Wharncliffe, gives an account, in one paper, of an improvement in the mode of raising annual flower seeds, that is worthy the attention of florists. Having observed that when hardy annual flowers, which have small seeds, are sown in open borders, and must be slightly covered, the greater part is destroyed by drought, he covers the patch of seeds with fine moist soil, and places a garden-pot inversely over it, which he allows to remain till he discovers that the seeds have struck root, when he raises the pot two or three inches, keeping it thus for a few days; and then he removes it entirely. The pot keeps the soil moist, and by the heat of the sun upon it, the seeds come up with great quickness; and therefore he does not sow for a fortnight later, or upwards, than he would otherwise do; thus avoiding the late spring frosts. The pots are a protection against heavy rains and small birds.

We next give some remarks by Mr. Fairbairn, upon the cultivation of the strawberry. He says, when the strawberry is going out of flower and forming its fruit, he stirs the surface pretty freely, and puts on an inch or more of well fermented dung, and in case of dry weather, he gives an abundant watering upon the dung or compost. "I then immediately lay down flat tiles, with a circle, at least half a circle, out of each tile, the surface of which I have painted black, for containing the greatest portion of heat. In the culture of strawberry plants I have discovered no mode so extremely advantageous to the grower, and productive of such delicious fruit, after numberless experiments, as the above simple and efficacious method. Mr. Fairbairn farther directs that the beds be of light soil, with a small portion of fine bark of the oak, and that the plants be put in after the usual way, only observing to make the tiles cover the whole of the bed or pavement. The night dews will thus be gathered by each leaf and stem, and the tiles, during the day, will not only prevent the exhalation of moisture, but collect great heat from the sun, consequently forming the fruit early, large, well-flavoured, and clean from sand.

Mr. Blake, gardener to Lord Rolle, has discovered a very simple and ingenious method of managing Camellias when forced. After remarking that most shrubs and plants will force, excepting the Camellia, he says, "It struck me that I could bring the varieties more regularly and quickly into flower by forcing them into bud." He takes the plants as soon as they are out of flower, shifts them by taking some of the old mould off the ball, and adding some rich compost, such as is used for pines, and then places them in a plant stove. The sudden transition from cold to heat causes young wood to grow directly, and as soon as he perceives flower buds he removes them back to the greenhouse till July, afterwards putting them out as much as possible in the shade. Thus he keeps a succession of flowers from November to May. He says that plants once early excited appear to look for it the same season again; and also suggests, as a succession of flowers through the year is an object of ambition, that the three following varieties of plants be attended to:— Chrysanthemums, Camellias, and Azalea Indica; the last mentioned he treats nearly in the same way as Camellias.

The ingenuity of florists has long been occupied in behalf of the Carnation, that they might discover the means whereby to protect it from the many enemies with which it is beset, not only through winter, but during its growing and blooming season. Mr. William May lays claim to the success of having, after many experiments, carried on for a number of years, overcome the difficulties and enemies that he formerly encountered in the cultivation of this beautiful flower, and has submitted an account of his practice to the consideration of the Society, which, in justice to him, and the advancement of horticultural knowledge, should be published.

He begins with the layers when first taken off the parent

plant in September, and immediately pots them, putting a pair in each pot, say of a forty-eight size, previous to which he has soil prepared, composed of one half old leaf soil, the other coarse pit sand. He puts a handful of potsherds, broken small, first into each pot, and then the soil, so that it will admit the root of the layer or plant within the rim of the pot, after which he places two layers in each pot close to the side, and fills up with the same sort of soil. He next gives a sufficient watering, and exposes them to the mid-day sun in a frame which is filled with old tan, so that it will just admit the pot and the plant to stand on the surface and not touch the glass. He now shuts them down, and for a few days shades them, until recovered, after which air may be given daily by degrees. In dry weather the lights may be taken off, taking care to close them again before the dew falls. Excess of wet must always be guarded against, for this is the source of many diseases. In the depth and screnity of winter, the lights are to be kept completely closed; but when the days lengthen and the weather changes, let the former system of airing, &c., until the end of March be observed, giving them full air for a few days and nights before finally revmoving them.

The next thing is to pot them by single plants in a thirty-sized pot, for blooming, for which purpose he has a compost preparing through the winter, made up of three-fifths deeom-posed leaf soil, one-fifth coarse pit sand, one-fifth road-scraping from a lime stone made road, or the subsoil next the lime-stone rock. These are turned and mixed well together, and cleared of worms, &c., which may have collected in it. The pots are again well drained with potsherds, then a little of the coarsest soil is added, when the plants may be turned out of their stove pots, and placed snugly, as already directed, the old ball of earth being reduced a little, so that the roots of the plant when finally placed may just be within the rim of the pot. The pots are then to be filled with the compost prepared and plunged in the ground where intended to bloom, the rim being just covered with soil.

A small quantity of soot is placed by Mr. May in the bottom where the pot is plunged, to prevent the entry of worms, thus preserving the plant from their ravages all summer. In the layering season, he places an inch thick of fine sandy soil round each pot, in which they strike root readily.

This method may be superior to that of growing carnations in large pots placed on the surface, when they must frequently be too moist or too dry; and also to that of planting them in the ground openly, where they must be subject to their enemies, the insects and grubs, and to too much wet in certain summers. Mr. May's plan is, we believe, quite original.

There are no observations which we could add, that would half so well recommend these transactions, or the Society under whose auspices they are published, to public favour and consideration, as any one of the short papers we have now extracted or abridged. It is delightful to think how silently and potently the most active, ingenious, and enlightened mem-bers of the community may be benefiting their fellow creatnres by such pursuits and discoveries as these papers regard. We have only to add, that it has been on account of the variety afforded, rather than the superiority of the papers quoted from, which their shortness allowed, that has guided our selection.

## ON COAL.

THIS article being the fuel most extensively used in this country, and not only on account of its domestic uscs, but its vege-table origin, it becomes a fit subject for our pages. In a com-pendious and comprehensive work, just published by Whittaker, & Co., under the title of "The History and Description of Fossil Fuel, &c. of Great Britain," we have an able account of the geo-logical origin, and natural history of this substance, from which we shall extract a few passages.

Numerous treatises have at different times been devoted directly and indirectly to disquisitions upon the nature and origin of coal, and the most conflicting conclusions come to on the subject. The most prevailing opinion is, that mineral coal is of vegetable origin; that the vegetable bodies have subse-quently to their being buried under vast strata of earth, been mineralized by some unknown process, of which sulphuric acid has probably been the principal agent; and that by means of this acid, the oils of the different species of wood have been con-verted into bitumen, and a coaly substance has been formed.

"In further illustration of the now so generally admitted change of vegetable matter into coal, by whatever process, and in addition to what has been said in reference to peat, it will be found that our own island presents us with a tripartite series of fossil combustible substances, the intermediate member of which exhibits, in a striking manner, the coal in that stage of partial mineralization, which appears so conclusive in favour of the theory of a ligneous origin: as an illustration of the most recent deposition, or modern member of this threefold series, may be mentioned the submarine forest on the coast of Lincoln-shire, the timber of which has not suffered any very important change in its vegetable character. There are several other accumulations of wood in different parts of the kingdom—in some cases the remains of forests known to have been existing within the period embraced by our annals. Occasionally, the substratum of our immense peat depositions consists, as pre-viously noticed, of vegetable remains of a much larger order than those forming the superior beds—trees of various descrip-tions, the species in many instances readily distinguishable, and affording by their exhumation, not only supplies of fuel, but even timber for various economical purposes. Striking ex-amples of this latter circumstance are daily taking place in Holderness, a large triangular district, consisting chiefly of peat moors, and tracts formed by the sediment of ancient inundations, bounded on one side by the German Ocean, on another by the estuary of the Humber, and on the third by the chalk formation of the Yorkshire Wolds. The other extreme series of ligneous matter, and which has undergone the most entire change, comprises the varieties of pit-coal, so abundant in many parts of this country, and in which almost every appearance of vegetable origin has been destroyed.

"As to the supply of the material itself, we have no reason to doubt but that, assuming the more ancient coal formation to consist of land vegetables analogous in their original growth to the largest trees at present known, the forests of the antedilu-vian world, might furnish a sufficient supply, if we merely judge from what we know of the exuberant growth of intertropical vegetation in our own times. To say nothing of what must be the fossil contents of a basin or valley into which some partial deluge should sweep one of the immeasurable forest tracts of North or South America, there are accumulations of drift wood taking place on some of the rivers of that quarter of the globe, which, whether destined to become coal strata, as some think, or otherwise, may, at some remotely future period, when the land will perhaps be comparatively denuded, and other changes have taken place, present a problem of almost as disputable if not difficult solution as that of the formation of existing coal fields. 'In the spring, or rather winter,' says Captain Basil Hall, 'when the freshes or floods come down, they bring with them millions of trunks of trees technically called *logs*. In February or March, the quantity of these logs is sometimes so great, that not only the river itself, but the sea for several miles off, was so completely covered over with them, that it re-quired some skill to get through. The whole ground—if the loose and muddy soil could be so called—appeared to be formed of layers of these logs, matted together into a network, or rather a gigantic raft of rough timbers, many yards, and perhaps fathoms in depth, over hundreds of square leagues. May not this stratum of vegetable matter,' asks the philosophic tra-veller, 'which there is every reason to suppose stretches over the whole delta at the level of the sea, become in some future geological revolution of the world a great coal-field?'

"Speaking of the great river Atchafalaya, and its enormous

raftage, Captain Hall adds: 'the river just mentioned flows out of the Mississippi at a point about 250 miles from the sea. Twenty-seven miles from the efflux the raft begins, and extends over a space of twenty miles: but as the whole distance is not filled up with timber, the aggregate raft is only ten miles long. The width of the Atchafalaya is 220 yards; the raft extends from bank to bank, and is supposed to be about eight feet thick. It has been accumulating for more than fifty years, and is made annually larger, by supplies of trees drifted into the river from the Mississippi.' In all likelihood, this immense aggregation of drift-wood will continue to increase, until in process of time it may become covered with sand, and afterwards with vegetation of the higher order, as already at certain seasons it is gay with verdure and flowers, and after a succession of ages, present either a seam of coal, or at least an accumulation of the analogous lignites.

"Various and conflicting opinions have been entertained by geologists, as to the original places of growth of the vegetable matter composing the great coal deposits; including the question as to whether or not they still occupy the stations where they grew. Some have contended that they may have floated for a long time, and from vast distances, before they sunk into their present beds, and became interstratified by the successive subsidences of stony and other matter. Others fancy they have had an inland origin, having sprung up and thriven on the borders of vast lakes, into which they have ultimately been swept by some sufficient agency. This lacustrine theory is in turn objected to, on the ground that the traces of plants in some superjacent strata appear rather to indicate a littoral or marine vegetation; hence the bituminous beds have been deemed of polynesian or insular derivation. Mr. Conybeare, however, is disposed to think that the coal vegetables were accumulated in friths and æstuaries, and afterwards buried there with the alluvial detritus that was swept away with them.

"The subject of antediluvian botany has exercised the ingenuity of the shrewdest investigators of physical phenomena, both in our own country and the continent, with the advantage that the fossil Floras of the coal formation in different places are remarkabiy similar. The naming and classification, however, of fossil specimens, exhibiting for the most part such varying and equivocal characteristics, and often such slight analogies to existing genera, must, it is obvious, be so difficult a task, that comparatively little of systematic harmony can be expected; and these difficulties increase as we descend from the comparatively recent to the more ancient deposits. Mr. John Phillips, of the York Museum (professor of geology in King's College, London), has, in the first part of his interesting 'Illustrations of the Geology of Yorkshire,' figured twenty species of monocotyledonous plants, as occurring in the coal associated with the liasic and oolitic beds about Whitby, and comprising specimens belonging to the kindred families lycopodinæ, equisetaceæ, filices, cycadeæ, and palmæ, of Sternberg; upon which he remarks that 'the result of all accurate enquiries into the nature and distribution of fossil plants, is, that they consist of three great distinct groups of species, which occupy as many peculiar repositories in the series of secondary strata: one group lies above the chalk (namely with the more recent lignites); another is included between the chalk and the lias) (i. e. connected with theWhitby coal); and a third occupies the coal measures and mountain limestone'—in other words, is associated with the more ancient carboniferous deposits. 'A cursory observer,' adds Mr. Phillips, 'may, perhaps, be led to confound together the ferns and calamites of the coal district with the ferns and equiseta of the oolitic rocks: though to a botanical eye their difference is very apparent: but who can mistake the lepidodendra of the former, the cycadiform fronds of the middle period, and the dicotyledenous leaves and fruits which abound above the chalk?'

"Among the more striking vegetable remains distributed in the coal formation, may be mentioned those usually identified with, or allied to, the genera of palms, pines, tree ferns, arborescent grasses, cactuses, and some of the verticillate plants. Almost all authors agree in representing the magnificent family of palms as having existed at a very early era of the vegetable world, and as being found buried with the others: and their remains, viz. fragments of stems, fronds, and fruits, are said to occur in the older coal formations. The singular structure of the wood of this genus of trees render the identification of the fossil specimens apparently less difficult, though not absolutely certain: the Rev. W. D. Conybeare refers the trunks or stems thus discovered partly to arundaceous plants, approximating to those now known; and to a very peculiar order, distinguished by the cortical part being entirely covered by regular impressions, resulting from the petioles and fallen leaves, ranging round them in spiral lines—these have been supposed to belong partly to the palmaceous order, and partly to anomalous forms, constituting a transition link between these and the coniferous plants, similar to that already established in Professor Sprengel's Natural System."

Thus, it would appear, that the vegetables which beautified the face of the earth for the happiness of one race of beings, have afterwards been stored up for the use of other successive generations of men.

These are some of the sentiments and descriptions found in the valuable work we have already named—a work not less interesting and instructive to the general reader than the philospher. It treats, indeed, of every thing connected with the interests of the collier, the coal-merchant, and the enactments passed by the legislature on one of the chief sources of Britain's wealth and strength, as well as on the theories of geologists; and at the same time, it is a book, written in sueh a strain as to rivet the attention strongly, and excite the fancy.

## DESCRIPTION OF THE PLATES.

### PUNICA GRANATUM.

COMMON POMEGRANATE TREE.

Icosandria Monogynia.—LINN.

Myrtaceæ.

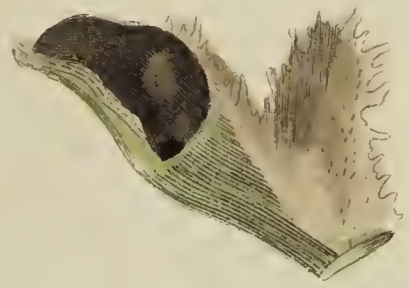
Gen. Char.—Calyx five-cleft. Petals five. Berry many-celled, many-seeded. Seeds berried. Placentas parietal.

Spec. Char.—Leaves lanceolate. Stem arborescent.

This tree rises to the height of eighteen or twenty feet; it is covered with a brownish bark, and is divided into many slender branches, which are armed with spines. The leaves are opposite or ternate, about three inches long, sessile, wavy, entire, oblong, or lanceolate, and of a bright green colour. The flowers are large, of a rich scarlet colour, solitary, or two or three together, and are produced at the extremities of the young branches from July to September. The calyx is bell-shaped, thick, fleshy, of a fine red colour, and divided into five acute segments. The corolla is composed of five large roundish wrinkled petals, rather spreading, and of a scarlet colour. The filaments are numerous, capillary, furnished with oblong yellow anthers, and inserted into the tube of the calyx. The germen is inferior roundish, with a simple style, the length of the stamens, and capitate stigma. The fruit is as big as an orange, globular, and somewhat compressed, containing numerous angular seeds, each enveloped in a distinct very juicy rose-coloured pulp, and is crowned with the calyx, and covered with a thick tawny coriaceous rind.

The pomegranate is a native of the southern parts of Europe, of Arabia, Japan, Persia, and Barbary, and is much cultivated in India and Ceylon. It will produce fruit trained against a south wall in many parts of England, and against a glass case, or against a flued wall. The fruit is as highly flavoured as that imported from Genoa or Leghorn. The best soil is a rich strong loam, and is readily increased by layers. The rind of the fruit and the flowers are both powerful astringents, and have long been successfully employed in gargles, in diarrhœa, &c.

Punica Granatum.



Cetraria islandica.

Watsonia humilis

Capsicum Annuu.

Ficus Carica. *The Common Fig.*



Pomme Princesse.

## CETRARIA ISLANDICA.

ICELAND MOSS.

Cryptogamia.

Gen. Char.—Apothecia roundish, plano-concave, attached obliquely to the margin of the thallus, and therefore loose beneath, elevated and bent inward at the circumference; gemmiparous plate surrounded by a projecting border formed by the thallus; within of simple texture, or slightly celluliferous. Frond membranaceous, foliaceous, irregularly lacinated, smooth below.

Spec. Char.—Fronds, lobes sub-erect, irregularly linear, multifid, channelled, fringed, the fertile ones dilated. Apothecia sessile, flat, with a raised entire border.

The Iceland moss seldom exceeds three inches in height, and is erect and bushy. The fronds form loose elegant tufts; they are membranous, somewhat cartaliginous, channelled below, variously sinuated, and lobed; the lobes being irregularly divided, notched, and fringed at the margin with hairs. The surface of the whole vegetable is smooth, shining, of a rich chesnut brown colour, with a green tinge when wet, paler underneath. In such plants as grow in the shade, the colour is a pale brownish-green. The fructification, or shields, are dark chesnut, large, polished, flat, without any border, growing close to the upper surface of the frond.

This species of lichen is a native of the mountainous heaths and woods in the alpine parts of Britain. It occurs in all the heaths and mountains of the north of Europe. It grows abundantly on the lava on the western coast of Iceland, where the whole plant is more luxuriant than with us.

The esculent properties of the Iceland moss are well known in many districts on the continent of Europe. In this country it is used in brewing, and in the composition of ship biscuit, whereby they are not attacked with worms, and suffer little from the action of sea water.

## WATSONIA HUMILIS.

LAKE-COLOURED WATSONIA.

Triandria Monogynia.—LINN.

Iridiæ.

Gen. Char.—Spatha two-valved. Flower tubular, with a six-parted limb. Stigmas three filiform, two-parted, with recurved segments. Capsule cartilaginous, many-seeded.

Spec. Char.—Flowers recurved. Tube the length of the spathe. Limb with acute segments.

This is one of the smaller species of this beautiful genus, the Cape specimens being from eight inches to a foot high, and the leaves about the third of an inch broad, linear, shorter than the stem. Corolla of one uniform colour. Spathe acute. Faux a complete cylinder. Segments quite regular, oblong-ovate, acute. Anthers above the faux below the stigmas.

A mixture of sandy loam and decayed leaves or peat is the best soil for these plants, giving no water when not in a growing state. In October, they should be planted in fresh pots, and kept in a cool situation, till their pots are well filled with roots, when they must be regularly watered, and they will flower well.

After they have done flowering and die down, take the roots up, and preserve them in a dry place till the following spring. It is readily increased by offsets from the bulbs or by seeds.

## CAPSICUM ANNUA.

ANNUAL CAPSICUM, OR GUINEA PEPPER.

Pentandria Monogynia.—LINN.

Solaneæ.

Gen. Char.—Corolla rotate. Berry without juice.

Spec. Char.—Fruit oblong, pendulous, and erect; their stalks smooth. Stem herbaceous.

The plant rises two feet high; is herbacoous, crooked, much branched, and has a smooth striated, somewhat angular stem. The leaves are ovate, acuminate, smooth, entire, of a dark-green colour, and stand irregularly on long foot-stalks. The flowers are solitary, petioled, proceed from the axillæ of the leaves and of a dirty white colour. The calyx is persistent, tubular, and divided into five short segments. The corolla is monopetalous, wheel-shaped, consisting of a short tube, divided at the limb into five segments, which are spreading, pointed, and bent inwards at the margin. Filaments five. Anthers oblong. Germen ovate, surmounted by a slender style, which is longer than the filaments, and terminated by a blunt stigma. The fruit is a long pendulous inflated pod, smooth, shining, of a crimson or yellow colour; two-celled, containing whitish spongy pulp, and numerous flat kidney-shaped seeds.

Guinea pepper grows naturally in both the Indies, is frequently cultivated in our gardens as an ornamental plant, and also for the sake of the young pods, which make a favourite pickle. The flowers appear at the same time as the fruit, and are produced from July to September.

## FICUS CARICA.

COMMON FIG-TREE.

Polygamia Triæcia.—LINN.

Urticeæ.

Gen. Char.—Flowers on the inside of a fleshy turbinate receptacle, nearly closed at the mouth.—MALE. Calyx 3-cleft, Corolla 0. Stamens 3.—FEMALE. Calyx inferior, 5-cleft. Corolla 0. Pistil 1. Seeds roundish, compressed.

Spec. Char.—Leaves 3 or 5-lobed, scabrous, bluntish, wavy, or somewhat toothed. Fruit top-shaped, umbilicated.

The stem seldom exceeds 15 feet in height, is branched from the bottom, and exudes when wounded or broken a milky juice. The branches are long, twisted, round, pliant, rough when young, and covered with an ash-coloured bark. The leaves are of a deep green colour above, somewhat paler beneath. There is no visible flower, for the fruit in its early stage serves as a common receptacle, containing in its cavity both male and female florets, each of which has a proper calyx that becomes pulpy, and invests the seed, as in the mulberry.

The varieties of the common fig are very numerous. In warm climates two crops are produced annually, one upon the former year's shoots, and another on the shoots of the same year. The last of these crops is the one which is dried, which is done either by the heat of the sun, or by means of an oven; these are then packed very closely in the small chests in which they are imported into this country.

The import of figs to Great Britain alone, which is principally from Turkey, amounts to 900 tons annually. Dried figs form also a very considerable article of commerce in Provence, Italy, and Spain; besides affording, as in the East, a chief article of sustenance to the native population.

Fresh figs, when ripe, are soft and succulent, and eaten with moderation, are a digestible, wholesome, and very delicious fruit. The dried fig is too well known, both in appearance and taste, to render it necessary that we should say more than that figs consist almost entirely of mucilage and sugar.

In this country fig trees require a good wall, with a south or south-east aspect; but in some parts of England, as about Worthing in Sussex, they are trained as standard trees, and produce abundanee of fruit, which ripens in August and September.

## PYRUS MALUS PRINCEPS.

POMME PRINCESSE.—PRINCESS APPLE.

Icosandria de Pentaygum.—LINN.

Rosaceæ.

Gen. Char.—Calyx five-toothed. Petals roundish. Apple closed, five-celled, with a cartilaginous putamen. Cells two-seeded. Testa cartilaginous.

Spec. Char.—Fruit large, depressed, yellow, streaked with red.

This variety is a tree of a middling size. The stem is covered with a brown bark. Shoots vigorous, of a pale ash colour. Leaves oval. Flowers pale blush colour. The fruit, of middling size, is attached by a small stalk. The skin is fine, easily detached from the flesh, and is of a beautiful yellow on the side of the wall ; the side next the sun is covered with long streaks of red from the bottom to the top. The flesh is fine and excellent, of a whitish yellow colour. The juice is not abundant, but is sweet and sugary. This excellent fruit ripens in October, and will keep till January.

It attains a great age, is in general very prolific, and the timber proves very valuable for the turner, millwright, and cabinet maker.

It may be propagated by layers, or grafting on crab stocks.

## JUSTICIA QUADRIFIDA.

TWIGGY JUSTICIA.

Diandria Monogynia.—Linn.

Acanthaceæ.

Gen. Char.—Calyx five-parted, equal. Corolla two-lipped or ringent. The lower lip divided. Anthers two-celled. Seeds attached by little hooks.

Spec. Char.—Leaves linear-lanceolate. Flowers nearly solitary, sessile, tubular four-cleft.

Stem slender, more or less tinged with purple, compressed between the joints with two downy stripes from the insertion of the petioles. Leaves yellowish green. Petiole very short ; its inside pubescent. Lamina from one and a half to two inches long, and four to five lines broad, lance-wedge-shaped, very entire with the margin recurved, acute, covered with an exceeding short pubescence scarcely perceptible to the naked eye, punctated on the under surface, where it is also while young abundantly bedewed with vesicles, from the oil of which a fœtid smell is diffused. Flowers only in the alternate axils of the upper leaves, which gradually decrease in size, so that the inflorescence changes to a slender thin spike, all pointing one way. Bracteas small, wedge-shaped. Peduncle of each flower very short and thick. Calyx thickly covered with vesicles. Corolla bright scarlet, with the base orange. Tube at the inflated part smooth, above it hairy, and within thickly bearded. Upper lip emarginated. Lower lip deeply divided into three segments. Filaments orange-scarlet, channelled. Anthers sagittate, their lobes somewhat obliqne. Nectarium large, saucer-shaped. Pericarpium broad-spatulate, comprest, and shining. Style scarlet and filiform. Stigma emarginated. Seeds ash-coloured, tuberculated.

It thrives well in any rich light soil, and cuttings strike freely in sand under a hand-glass in heat.

## GUAIACUM OFFICINALIS.

OFFICINAL GUAIACUM, OR LIGNUM VITÆ.

Decandria Monogynia.—Linn.

Rutaceæ.

Gen. Char.—Calyx five-cleft, unequal. Petals five, equal. Capsule angular, two to five-celled.

Spec. Char.—Leaves of two pair of elliptical obtuse leaflets.

This tree rises to the height of thirty or forty feet, and is near a foot in the diameter of its trunk, with numerous divaricated knotty branches, leafy at the ends. The bark is very smooth, variegated with green and white ; that of the branches being uniformly ash-coloured, striated, and marked with fissures. The wood is hard and ponderous, dark olive brown within, whitish towards the bark, and has a peculiar acid aromatic scent. Leaves opposite, abruptly pinnate ; leaflets obovate, acute, dark green. The flowers are pale blue, on simple, axillary, clustered stalks, shorter than the leaves. Capsule somewhat turbinate, on a short stalk, smooth, succulent, ferruginous, or yellow, with from two to five rounded slightly bordered angles, and as many cells bursting at the angles. The seeds are solitary, pendulous, convex on one side, angular on the other.

This tree, the wood of which is well known in England under the name of Brazil wood, or *Lignum vitæ*, is a native of Jamaica and the warmer parts of America, flowering from July to September.

The wood of this tree, and the peculiar matter which it yields, are the parts medicinally employed. It has a warm, somewhat bitter taste ; and its virtues depend upon the resin-like substance which it contains. It is rasped for medical use. By boiling the raspings in water and common salt, the *guaiac* swims at the top, and may be skimmed off. It is principally used as an antidote agains lues venerea.

It grows freely in a mixture of loam and peat, and is increased by ripened cuttings, taken off at a joint, planted in a pot of sand, and plunged under a hand glass in heat.

## HIBBERTIA GROSSULARIÆFOLIA.

GOOSEBERRY-LEAVED HIBBERTIA.

Polyandria Trigynia.—Linn.

Dilleniaceæ.

Gen. Char.—Stamens indefinite, free, filiform, equal. Anthers oval, oblong. Nectaries from one to fifteen. Styles filiform, inflexed. Sepals and petals five.

Spec. Char.—Leaves nearly orbicular, crenate toothed. Flowers on peduncles opposite the leaves. Stems procumbent or climbing.

Stem dark red, slender, trailing on the ground, round, hairy. Leaves at first bright green, afterwards darker, and tinged with red : petiole short, hollow, dilated at the bottom : lamina nearly orbicular, toothed, nerved, rough, with very short hairs, somewhat wrinkled. Flowers like those of *Potentilla*, solitary, without smell, on peduncles which come out here and there opposite to the leaves. Bracte small, placed near the bottom of the peduncle, persistent. Calyx of five egg-shaped wedged leaflets. Petals five, yellow, obcordate, converging closely during the night, deciduous. Filaments from sixty to seventy, short, persistent, and changing from yellow to red after the petals are gone. Styles long, recurved so as to project between the filaments. Stigmata emarginated. Pericarpia from ten to thirteen, glomerated and bearded with long white hairs.

It is a low trailing shrub, native of New South Wales, with bright yellow solitary flowers, which are produced through the greatest part of the summer ; and thriving best in an equal mixture of sandy loam and peat ; increased by cuttings, which strike root readily under a hand-glass in the same kind of soil.

## LASIOPETALUM PURPUREUM.

PURPLE-FLOWERED LASIOPETALUM.

Pentandria Monogynia.—Linn.

Byttneriacæ.

Gen. Char.—Calyx permanent. Petals five, gland-formed. Filaments five, free. Anthers bursting by two pores on the inside. Capsule three-celled, three-valved, two-seeded.

Spec. Char.—Segments of calyx, tomentose on both sides.

A low decumbent shrub, unless supported, covered in every part, not excepting the flowers, with a stellated pubescence. Leaves oblong-elliptical, quite entire, alternate, stipulæ heart-shaped, oblique, sometimes lobed, growing in pairs or singly above the petiole. Peduncles two or three times longer than the leaf, about six-flowered ; flowers looking one way ; they have no corolla, but a purple-coloured calyx, supported underneath by a ternate involucre, or bractea, consisting of three linear leaflets looking all one way. Stamens five. Filaments very short. Anthers black, conniving at the point. Germen superior, three-cornered. Style considerably longer than stamens ; stigma simple.

The lively purple flowers without scent remain very long expanded and coming in succession ; this little green-house shrub continues in blossom nearly half a year. It is a native of New South Wales, thriving in a sandy peat, with a slight admixture of loam, and is readily increased by cuttings.

Justicia quadrifida.

Guiacum officinalis.

Hibbertia grossulariæfolia.

Lasiopetalum purpureum.

## CORK.

This county is situated in the province of Munster. It is bounded by the county of Waterford on the east; that of Kerry on the west; those of Limerick and Tipperary on the north; and by the Atlantic Ocean on the south. Both in extent and population it is by far the largest in the island. The variety of its scenery is also great. With an extensive range of bold and rugged sea-coast—some large rivers and many small streams—mountains and hills of various heights and aspect—plantations of thriving wood—corn-fields, and walks of sheep and cattle—towns, villages, and hamlets—and a multitude of family seats, belonging to noblemen and gentlemen of fortune—it offers to the traveller's eye every diversity of grand and beautiful, of rich and barren prospect. Indeed, some parts of this county, particularly Glengariff, in the neighbourhood of Bantry Bay, rival Killarney itself.

The county is in general hilly. Very little of it can be with propriety called flat, and the whole of the south-west part is formed by a ridge of mountains, which rises to a considerable height, and extends into the sea. Most of its western side is rough and uneven, but not so much so as to prevent it from being subjected to the plough. It contains great tracts of poor land, particularly in the barony of Ban and Bantry, and in the western parts of Carbery and Muskerry, in which the Sheely mountains are situated. A great portion of the mountainous land is either naturally so wretched in soil, or has been so little attended to where it is susceptible of improvement, that it is not worth many pence an acre; and even the flat hills, that are situated at a distance from towns, bring a very low rent. Some of those, however, in the neighbourhood of large towns, are cultivated almost to the summit, and are tolerably productive. Nor are there wanting individuals who have done much for the land that is in its natural state very sterile. The good land in this county predominates, and while in many places its quality is excellent, in some it has been brought to a high pitch of cultivation, as may be seen in the vicinity of Blackwater, and in the barony of Innskilly.

The south-west and northern parts have been much neglected; they are, however, very capable of improvement. In the southern districts a great quantity of different kinds of grain is produced, though the individual qualities are small, in consequence of the land being much divided. But the crops of wheat are seldom abundant, although to the south of the city of Cork this grain forms a regular part of the rotation of crops. Barley is cultivated in the same proportion as wheat, each occupying the land occasionally, as the farmer happens to be influenced by prices. Barley is chiefly in demand by the breweries and distilleries in the city of Cork. Bere or bear affords a pretty good return; while oats are sufficiently abundant. Some hemp is cultivated, but much more of flax. Clover and turnips are but on an insignificant scale among the common farmers, while potatoes are every where raised in great abundance, engrossing almost the whole of the manure, and proving that agriculture in this country has not generally arrived at a high degree of advancement. Indeed, the agricultural state of Cork cannot be very favourably spoken of, considering the many advantages, both of soil and climate, as well as maritime situation; for these are sadly counteracted by other circumstances. The peasantry are, in the first place, in a depressed condition. There is, therefore, a want of capital, and consequently of exertion and skill for the furtherance of an enlightened system of husbandry, at the same time that the landlords are illiberal and unenlightened as to the best means by which to encourage and assist their tenants. We have so lately pointed out to our readers certain suggestions, as offered by more than one writer on the mode of benefiting the peasantry and teaching the agricultural art in Ireland, that we shall not now say more than express our conviction, that were the landed proprietors of that country generally to reside amongst their tenantry, and take due means to instruct them in the art we speak of, as well as to lend them such assistance as would first afford a starting point for the full exercise of the people's industry and ingenuity, we should not long have to complain of the agriculture of Cork, nor, as at present we must do, of its condition in most or all of the Irish counties. It must be admitted, indeed, that in spite of all the discouragements which the farmers meet with in Cork, there is a gradual improvement.

The county possesses many advantages, as we have already said; and amongst these, we may mention the inexhaustible store of coral sand to be found in the bay of Glengariff, which is held in the highest esteem, and is much employed in the neighbourhood as a manure. It is purely calcareous, and its effects are said to be perceptible for twenty years. Sea-sand also, containing a great deal of calcareous particles, is very generally used on the coast. It is usually laid upon the ground just as it is brought from the shore, and not unfrequently it is, in the first instance, put into the farm-yards instead of straw, for the cattle to lie upon, and after being impregnated with their urine and mixed with their dung, is carried out to the fields. It is said to ameliorate very much the quality of the ground, not merely as an alterative, but in a mechanical way, by opening and mellowing the soil. Sea-weed is also abundant, as might be expected from the maritime situation of the county. It is principally applied to the potato grounds, and is the source of considerable profit to the proprietors on the coast. Marl also abounds, and is a favourite manure. Fossil shells are also found and used. Dung and straw manure is not such an object with the farmers of Cork as in most other counties. In some parts, however, it is not uncommon for people to pound straw into muck on the high road, and for this purpose to have it always in front of the farm-house. The roads being made of limestone, a deal of this material is scraped off when the pounded straw is removed, and in this way an excellent manure is obtained. The farmers, however, have not generally a proper notion of the value of manure. As a proof of this, they often erect their houses upon the very margin of a public road, in the channel of which a great proportion of the manure is washed away, and for the sake of economy they grudge a few perches of ground to the use of the farm-yard, which indicates great ignorance.

The implements of husbandry are badly constructed and badly managed in this county. The plough, for instance, has a coulter and sock so obliquely placed as to oblige the ploughman to hold it to one side, in such a manner as to keep the mould-board out of the ground. The teams of horses amount sometimes to four or more, yoked abreast. But it is still more strange that the common farmers are not provided with a roller or heavy harrow. Spade culture is very prevalent. Their flails are most inefficient instruments, owing to their slightness. The larger farmers employ labourers, whom they pay with conveniences, such as a house, ground for potatoes, grass for cattle, &c.

The cattle are rather of an inferior breed. Among the mountains towards the south-west of the country, a small breed has been introduced, by frequent crossing of the native Irish breed, or with the long horned. There is a great number of dairies in the county, the favourite breed for which is the half Holderness. The common Irish cow frequently equals them in the quantity, and the Devon cow, which has been introduced in some parts, excels both in the quality of the milk. Cork butter has long been celebrated for its sweetness. In the mountainous districts there is a small breed of sheep, thin in the fore quarters, narrow in the loins, and with almost as much hair as wool. There are few large flocks, and a sheepfold is hardly ever to be seen. There are numbers of goats, which are chiefly kept by families that cannot afford to purchase cows. In some parts hogs are kept to a great age, and grow to an enormous size, which are fed on potatoes only, and allowed to run about all the time.

The fences are generally upon a bad plan. Trees are not admitted, therefore an appearance of nakedness prevails, and shelter is wanting to the crops and the cattle. The usual fence is a bank from four to five feet broad at the base, tapering to the top, and being between five and six feet high. Sometimes it is composed chiefly of stones, and, in general, furze covers

the top, which, when well grown, makes a pretty good fence, and serves for winter food for horses, and for fuel.

From what has been said, we cannot expect that the condition of the farmers in Cork is of a superior kind. Most of the farms are very small and there is a practice of letting them to the highest bidder. The cotter tenant is in a very wretched state. The houses of both classes are miserable hovels, their mode of living is coarse, and their manners rude. The agricultural, as well as the moral character of a county may generally be read in the condition and manners of the cotters and labourers. These have here a cabin and a small patch of potato ground at a low rent. The cotter also agrees for the keep of five or ten sheep at a still lower rent, at the same time working for his landlord at very small wages; but when he comes to settle he seldom receives any thing, as the food of his sheep is set off against his labour, in this way never improving his condition, for while he toils without end, his family eats up all the produce of his spot of ground.

Fuel in this county consists chiefly of turf. There is some coal, but it is not of a good quality. There is some valuable wood, but still a very great field for its extension. Planting has, of late years, by some individuals, been carried on with much spirit. There are numerous orchards on the banks of the Blackwater, which are very productive, and in various places nurseries. Among the farmers, kitchen-gardens are so seldom seen, (the author of the survey of Cork says, whose work was published in 1815,) that a stranger might suppose they were prohibited by law. Give them potatoes, and they are willing to dispense with every other sort of nutritious and profitable vegetable.

In this county there are various kinds of manufactures, such as linen, sail-cloth, canvass, &c. The muslin manufacture has been introduced partially. Gunpowder is made near the city of Cork, and is the only manufactory of the kind in the kingdom.

The county contains the three dioceses of Cork, Ross, and Cloyne. According to the new arrangements for the Church of Ireland, these are to be re-united. Its climate is not so varied as might be expected in a district so extensive. Its general character is that of a mean between the extremities of heat and cold. Along the coast winter is disarmed of much of its severity by the prevalence of southern winds, which seldom allow the heaviest snow to lie many hours undissolved, except on the northern sides of high hills; the sea-breeze equally tempers the summer heat.

There is also reason to believe that the climate has been materially improved by the felling of the forests, and the drainage of the bogs and marshes. The population in 1812, was, according to the first parliamentary census, 603,328; in 1821, it was 730,444; and in 1831, it was 807,446. The county is divided now into two ridings, eastern and western, containing in all, twenty-two baronies. The city and liberties of Cork constitute a separate jurisdiction, though included in the eastern riding. There are numerous islands along the coast; and the want of the means of inland navigation is in a great degree compensated by the numerous bays and inlets capable of admitting large vessels, with which the county is indented.

The Roman Catholic religion greatly predominates. The people are in general of a middle size, muscular in their limbs, and capable of enduring great fatigue. When young, they are well-looking, but owing to early marriages, and the smoky state of their cabins, they soon contract an old and wrinkled appearance.

## ON PEAT.

We last month extracted some curious information regarding the natural and geological history of Coal, from a work lately published on Fossil Fuel—a work, which we are happy to learn, is destined to become a standard in our commercial literature, rich as this branch already is, in scientific and practical treatises. In the same volume there are some notices regarding the natural history and formation of peat, which will be found equally interesting, and equally suited to our pages; for as respects this article there has been almost as much discordance of opinion, as on the origin of coal.

"For instance, it was supposed by one author, to have had an origin coeval with the hills or the valleys in which it is formed;—by another, to have been a bituminous deposite of the sea;—by a third, the wreck of once-floating islands;—and by Pliny and others, to have had an entirely mineral origin. The fact that theories like these should have been taken up by modern writers, is the more remarkable, when it is recollected that peat-bogs or mosses, not only lie so immediately commodious for inspection, as that their growth and transformation may be said to take place before our eyes; but, from the various animal and vegetable remains, and even works of art, which have been occasionally discovered embedded therein, their recent formation, as compared with the coal strata, is rendered indisputable*. Dr. Anderson, as well as Dr. Platt, entertained the opinion that peat, as we find it in its natural state, is a vegetable production, not a congeries of dead plants preserved by some mystical influence, as had been generally supposed, but actually alive, and in the highest degree of perfection of which it is ever susceptible. In its analysis, recent qualities, decomposition, and final decay, every circumstance, in the opinion of Dr. Anderson, tends to point it out as a recent vegetable substance, possessing certain properties of fresh vegetables, particularly that of inflammability, in a high degree of perfection. Its *appearance*, he admits, is indeed very unlike to those vegetable substances we have been used to observe, and more nearly resembles a mass of putrid vegetable matters than a real living substance†.

"Mr. Parkinson objects altogether to the notion of deriving our peat-bogs from the germination and increment of a peculiar kind of moss. 'Did peat,' says he, 'owe its formation to the supposed moss-plant, we should not expect to find it, as it often is found, almost entirely composed of other species of vegetable matter. Indeed, that which is here supposed to have originated in one particular mode of vegetation, appears to depend on a certain change which affects vegetable matter in general; but perhaps some parts of the vegetable creation more than others. Thus the *confervæ* and the mosses, and particularly the *sphagnum palustre*, appear to be vegetables which are peculiarly calculated to suffer a conversion into this kind of substance. The promptitude with which the species of plants just enumerated appear to submit to their change, and their disposition extensively to spread themselves, through every interstice of such peat-bogs as they have possessed themselves of, may perhaps account in a great measure for that augmentation of peat mosses, which the Doctor (Anderson) says can have happened in no other way than by its increase in the manner of growing vegetables from the time of its first generation to the present hour.'

"To prove that this augmentation is not of *growing peat*, but of vegetable matters under the influence of the common laws

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* The time required for the production of a given depth, has been a subject of frequent inquiry. In some cases, its growth has been so rapid as to be sensible to the observation of individuals, but, in general, it has been necessary to have recourse to evidence founded on circumstances involving a much longer period than human life. It has been remarked on the continent of Europe, that cavities of seven feet in depth have been filled with it in the short space of thirty years. And peat mosses have formed over certain fallen forests in Scotland, within fifty or sixty years: but we are not told to what thickness. Roman roads, utensils, and coins, have been found buried seven feet under mosses in this country: and only a few years ago, the palings of a park, described by Camden, were discovered beneath Chat Moss in Lancashire.—*Vide an elaborate article on Peat, by Dr. Macculloch, in Edin. Phil. Journal*, 1820, vol. ii, p. 40.

† In Holland, submarine peat is derived from fuci; and on parts of our own coast from *Zostera marina*.—*Lyell.*

of vegetation, and at the same time to point out more clearly what appeared to be the actual circumstance which seemed to corroborate Dr. Anderson's opinion, Mr. Parkinson adduces an account of the process as delivered by an eye-witness. Dr. King, in a paper presented many years ago to the Dublin Society, says, that 'Ireland doth abound in moss, more than, I believe, any kingdom, insomuch that it is very troublesome, being apt to spoil fruit trees and quicksets. This moss is of divers kinds: that which grows in bogs is remarkable; your light spongy ground is nothing but a congeries of the threads of this moss, before it is sufficiently rotten, (and then the turf looks white, and is light). I have seen it in such quantities, and so tough, that the turf spades would not cut it: in the north of Ireland, they, by way of joke, call it *old wife's tow*, and curse her that buried it, when it hinders them in cutting the turf: it is not much unlike flax: the turf holes in time grow up with it again, and all the little gutters in bogs are generally filled with it.' The process by which the substance of peat is formed from these vegetables Parkinson considers as 'a bituminous fermentation peculiar to vegetable matter placed in such situations, as not only exclude the external air, and secure the presence of moisture, but prevent the escape of the more volatile principles, and which terminates in the formation of those substances termed bituminous.'

"It is now well known that turf, in general, consists of a congeries of the roots and fibres of about forty different species of plants, chiefly mosses, amongst which the *Sphagnum Palustre* of Linnæus, (*S. Latifolium*. Eng. Bot.) largely predominates. In addition to heath and fern usually growing on turf moors, we commonly meet with the *myrica gale*, or Dutch myrtle, and one or more species of cotton grass (*Eriophorum*), with its beautiful white tuft.

"Mr. Hunter, speaking of the turf moors on Hatfield Chace, comprising thousands of acres, from whence a great part of Yorkshire was for ages supplied with fuel, observes, that when the turf is removed, a natural mould is discovered, like that of the surrounding country; 'and a native of these regions, who had watched the labourers on the moors, avers that he has seen the land beneath the turf lying in rig and furrow; as if, before the turf collected upon it, it had been submitted to the higher operations of husbandry.'

"In some parts of Aberdeenshire, Dr. Anderson informs us, there is found a certain kind of peat-moss, which when formed into peats in the common way, the latter are found to be more tender and brittle than usual, so as to break down, in the process of drying, into irregular lumps called clods. When one of these clods is thrown into the fire, it soon kindles, and burns with a clear bright flame, much resembling that which would be produced by a lump of tallow or butter in the same circumstances: these are therefore called *creeshy*, i. e. *greasy* clods, though they discover no degree of unctuosity to the sight, smell, or feel. These lumps, which are not common, are used as we use chips of wood, for kindling or reviving the fire. Professor Jameson states, that in some of the peat mosses in Scotland, the curious substance called mineral tallow has been found; and as it is now known to chemists that the muscular parts of animals, after having been buried some time where water could have access to them, are changed into a fatty substance resembling spermaceti, and called *adipocere*, it has been conjectured that the unctuosity of this peat and the mineral tallow are indebted for their existence to animals that have been buried in the bogs; in which situations indeed the more solid proofs of such occurrences are often found. Besides, it is now well known that many of these vast mosses occupy the sites of forests that have perished within the historic period—the causes which have led to this destruction are various: but in many places, besides the record or tradition of the fact, not only are prostrate trees, but upright rooted stems found abundantly embedded in the accumulated vegetable matter of the bog. Some of the largest trees known in this country, and well adapted for the masts and keels of vessels, have been discovered in such situations. Mr. Hunter informs us that in the bogs about Hatfield, 'firs have been found thirty yards in length, and oaks twenty-five and thirty-five yards: trees of other species are found, as the ash, birch, yew, and willow; but the fir is the most abundant: large quantities of fir cones and hazel nuts are discovered.'

"One of the most interesting facts in the history of peat, is its containing powerful antiseptic properties, by which animal substances are preserved entire for a great number of years. Many such instances are on record. In June, 1747, the body of a woman was found six feet deep in a peat moor in the Isle of Axholm, in Lincolnshire. The antique sandals on her feet afforded ample evidence of her having been buried there for many ages; yet her nails, hair, and skin are described as having shown hardly any marks of decay. A pair of sandals taken from the feet of a body so found in the time of Elizabeth, were long hung up in one of the churches in this country, as having belonged to an antediluvian. The vast antlers, and even the entire skeleton, of the gigantic elk (*cervus elephas*,) now extinct, sometimes occur in the Irish bogs; as do also the remains of man. In a turbary on the estate of the Earl of Moira, in Ireland, a human body was dug up, a foot deep in gravel, covered with eleven feet of moss; the body was completely clothed, and the garments seemed all to be made of hair. Before the use of wood was known in that country, the clothing of the inhabitants was made of hair, so that it would appear that this body had been buried in that early period; yet it was fresh and unimpaired. In the Philosophical Transactions we find an example recorded of the bodies of two persons having been buried in moist peat, in Derbyshire, in 1674, about a yard deep, which were examined twenty-eight years and nine months afterwards; 'the colour of their skin was fair and natural, their flesh soft as that of persons newly dead.'"

Some have supposed that there is a close connection between peat and coal, and that they form different stages of the same transmutation of organized matter. We leave that question to mineralogists and geologists.

## ON THE ORIGIN OF BUDS.

Physiologists have always found it a difficult question, when they came to treat of the origin of buds. Generation, whether animal or vegetable, is necessarily a mysterious process, and all that we can do is to watch its future results, and form our opinions by inference. As to generation by a bud, there have been many opinions. Pliny, without assigning a particular ground for his belief, thought that buds were formed from the pith, or the cellular tissue, which he regarded as *viscera* destined to the elaboration of the sap and protrusion of future buds. Du Hamel entertained different opinions. He at first thought that buds were formed from the pith or wood of the former year. But whence then comes the first year's bud? He changed his views afterwards, and regarded buds as proceeding from pre-organized germs existing in the proper juice, and deposited by it in the course of its descent from the leaves, so as to pervade the whole plant. And his proof, without telling us whence these pre-organized germs are themselves formed, is to the following effect: he took some cuttings of a willow, stuck them in the ground, and made them pass through a barrel filled with earth, so as that a portion was exposed to the air both below and above the barrel. The part inserted in the ground produced roots, and the part passing through the earth in the barrel produced roots also; but the portions above and below the barrel that were exposed to the air, and free, produced branches. It was of little importance whether the cuttings had their upper or lower extremities, as regarded their original growth, planted in the ground, neither did their passing through the barrel horizontally materially alter the results. Hence, Du Hamel concluded that germs both of the root and branch are dispersed throughout the whole extent of the plant, and are developed as the case may require.

Mr. Knight's views have accorded pretty closely with the above opinion, without the adoption exactly, it is understood, of the fancy about the pre-organized germs. But as to the buds

generated in the alburnum, he contends that the agency is by means of the descending proper juice, and that it possesses the power of generating buds. His proof was as follows: the runners connecting the tubers of a potato with the root were intersected, and immersed by both portions in a decoction of log-wood. The decoction passed along in both directions; but it was in the direction of the tubers that the proof wanted was elicited; for there the decoction was found to have passed through an elaborated *plexus* of vessels between the bark and alburnum, which was seen to approach the skin at the base of the buds. Hence it was inferred that buds are formed by the agency of the descending proper juice in its passage through the vessels of the inner bark. Mr. Knight also says that the alburnum has the power of regenerating buds. A number of plants of the apple, pear, and plum, which were raised from seed, and in spring, were cut down to the collar in autumn, with part of the root exposed. In the beginning of the following spring, protuberances were observed on the bark of the exposed roots, which were found to be processes issuing from the alburnum. They were incipient buds, and ultimately protruded into shoots. Experiments upon the stem and root of aged trees gave the same result, establishing, as the experimenter thought, that the laburnum, or the proper juice deposited in it, has the peculiar property of the organizing of buds; whence it follows that the origin of any bud is not more deeply seated in the stem than the layer of alburnum.

Others maintain that buds are only generated by the plexus of the vessels of the inner bark, where the union of the graft and stock is effected in the operation of grafting; whilst it has more lately been argued that all buds protruded from the surface of the plant at whatever period of its growth, have been originally formed at the centre of the stem or branch on which they appear, that is, in the original or annual shoot, and have been pushed outwards, horizontally, through every additional layer of alburnum while yet in a soft state, though it requires some peculiar excitement to protrude them into shoots, which may not occur till after a period of many years. The bud in its progress outwards, is represented as leaving behind it a pale streak of parenchyma indicating its path, which is in the direction of the medullary rays, and very perceptible in the transverse section of the willow taken near the place of the protrusion of a young shoot. This rule can apply, however, only to woody plants which have their diameters augmented by the addition of annual and concentric layers. It is not a new doctrine, however. Mrs. Ibbetson believed she saw, by means of a microscope, the buds in the very act of crossing the concentric layers on their way to the alburnum; and others have advocated the principle.

An outline of the general opinions now glanced at, was given by the Rev. P. Keith, in the Transactions of the Linnean Society, a few years back, which he follows up with an account of certain experiments employed by himself, and with his own conclusions on the subject, which we will now abridge or extract. Such experiments and speculations must inevitably lead to valuable as well as interesting discoveries, if they are carried on with the due order of a patient and cautious induction; and whether the individual examples we may now and then select of these speculations be in themselves perfectly correct or not, is not always so much the question with us, as the excitement on the part of inquirers, which they are calculated to keep alive, and the mode of procedure which they teach.

Mr. Keith had been, for the sake of elucidation on the origin of buds, looking out in summer for a good subject of inspection, and found rather opportunely the stem of a willow of about twelve years growth, which having been felled in the preceding winter or spring, was left on the ground at its full length, and in rather a moist situation. In the month of August, it was furnished with a number of young shoots protruding from its upper surface, which had evidently been formed posterior to the felling of the stem; and, according to the last mentioned doctrine, would be traceable to the centre. He took a number of transverse sections of the stem; and could, in all cases, trace the path of the progress of the bud by means of the streak above alluded to, extending from the centre, or nearly so, to the base of the shoot. There were many other streaks terminating not in shoots, but in an emerging point between the alburnum and bark, which point contained, no doubt, a bud that might have been protruded into a shoot in some future year.

"There is," says Mr. Keith, "a capability, no doubt, in the annual protrusion of the bud into every additional layer of alburnum, that accounts well for the ready supply and regeneration of buds which almost all perennials furnish when lopped or accidentally mutilated. The fact is evidently hostile, as far as it goes, to the opinions of Du Hamel and of Knight; but it does not amount to a refutation of them, for that which is true of the willow may not be true of every other tree. There are some trees in which no trace can be observed of the horizontal streak of parenchyma, from the origin of the shoot to the centre of the stem." The opinions also of Du Hamel and Knight are not altogether established by the facts they adduce, for the result of their experiments it may be, would have been the same, whether buds originate at the centre, or at the circumference; for though at the circumference, the question whence they came, or by what route, is not made out by them. Yet, Mr. Keith thinks the matter might long ago have been decided, if proper experiments had been instituted. The nature and extent of his own experiments come therefore to be explained.

In the month of September, he observed a shoot actually issuing from the lip formed over the section of a lopped branch of a lime-tree. The question is, in what did the bud originate—in the lip, or in the truncated branch? That he might ascertain the point, he caused, a few days afterwards, a portion of the trunk to be sawed off, so as to expose the origin of the bud as much as possible. The inspection was not decisive, as the lip was the growth of one year only. Soon afterwards he observed an elm-tree, about eight or nine inches in diameter, and twenty feet high, the stem of which had been wounded some years before, by a portion of its bark having been stripped off to the extent of about ten inches in length, by five or six in breadth, and at about a foot and half from the ground. On the edges of this wound was a lip of new bark and wood, narrowing its extent, and forming a margin of between two and three inches in breadth. The surface of the lip indicated a growth of three years, and from the last and innermost ridge, there had issued two shoots, of several inches in length in the course of the preceding summer. But he infers that these shoots could not have originated from the pith of the central layers of wood, because the vitality of the outer layer had been destroyed by the atmosphere; nor could these shoots have protruded from any given point in the sound part of the layer that was partially injured, unless they had travelled across the divergent layer, of which there was no proof of their having done.

Some time after this he caused to be extracted the piece that contained the shoots, and his inspection of this portion corroborated his opinions. The buds had no radiant nor radical connections with the centre of the stem, as was evident from the intervening layer of dead wood. Beyond that layer the medullary rays began anew, and took a totally different direction. Hence, the shoots must have originated in the lip, and sprung from buds, which, if not formed by, were yet conveyed to, and deposited in the alburnum, through the agency of the proper juice, without having ever been connected with the pith, and without having been annually protruded towards the surface through each successive layer of wood, establishing, to a certain degree, Du Hamel and Knight's doctrine; and proving that a bud appearing on an old stem, does not always originate in a germ generated at the development of the stem or branch on which it appears.

If it should be said that buds are not yet fully accounted for, and that we must go back to the seed, which, in many cases, indicates the rudiments of buds, in the protuberance that is usually formed at the collar of the embryo plant, at first a simple vesicle, next an enlarged globule, at least in the matured shoot a distinctly visible body, one or more buds

crowning the shoots, some protruding from its surface, and many, as it appears, imbedded in the laburnum. How have they been generated? Are we to suppose, as Leibnitz did, that the embryo plants contains already in miniature, all the buds it will ever give forth, in this determinate order? Such a doctrine looks like the involution of all future generations in the first individual of the species, and baffles our imaginations. And yet it is difficult to see how it can be done without, if we adopt the opinions of those who maintain that all buds have been formed originally at the centre of the stem or branch on which they appear. Du Hamel and Knight's hypotheses seem to account much better for the phenomena in question. The first speaks of pre-organized germs, Mr. Knight of the proper juice, as having an unlimited capacity of forming and dispersing buds. These are somewhat gratuitous principles to be sure; but whether rightly expressed by any such ideas or not, there appears to be reason for supposing that there is something which has a capacity of propagation.

Mr. Keith says, "if we admit that one bud has the capacity of generating others, the difficulty is got over." Say that this process is effected by the bud or buds lodged in the embryo plant, or protruding from the surface of the shoot, and that the new-formed bud, or rudiment of the bud, is a minute, insulated, and imperceptible globule, or filament, there is nothing incredible in the supposition of its being carried upwards with the current of the ascending sap in its passage through the alburnum, or of its entering even the plexus of vessels of the inner bark and being again carried downwards with the current of the descending and proper juice, as well as ultimately deposited in a situation favourable to its future evolution. The necessity of accounting for the appearance of the bud and shoots that originated in the lip of the closing wound of the elm-tree, that is, in a new layer of alburnum that was spreading over the surface of an old and dead layer, render the adoption of this or some such hypothesis indispensable.

## THE WEEDS OF AGRICULTURE.

The word weed in the sense here used is a relative and a very comprehensive term. All the plants which in one department or other of the art of Agriculture, might fall under the name of weed would require the enumeration of a principal part of the whole British Flora; but as regards utility, this is unnecessary, according to the view we are about to take. In this view, we avail ourselves of some plain hints and descriptions which have at various times been published by men of skill and practice for the benefit of young farmers.

The weeds of agriculture may be divided into, 1st. Those which infest samples of corn; 2nd. Rooted or fallow weeds, and such others as are hard to destroy; 3rd. Those which are principally objectionable as they encumber the soil; 4th. Underling weeds, such as never rise with the crop, nor come unto the sickle. At present we confine ourselves to weeds which infest samples of corn, and follow the statement which the late Mr. Holditch has written on the subject, as edited by G. Sinclair, the author of Hortus Gramineus Woburnensis.

Of the weeds spoken of, Darnel (*Bromus Secalinus* and *Bromus Mollis*) smooth rye, broom-grass, and soft broom-grass, is the first-named. This frequently grows in fields, but it is most hurtful among rye-grass which is mowed to thrash. In the sample the seed is bigger and broader than rye-grass, and has a short awn. It is just so heavy that it escapes the degree of wind which rye-grass will bear, and therefore infests the samples as they are offered by farmers; but the seedsmen who buy large quantities, take it out by means of a sieve which lets the rye-grass through. This weed in the fens is called cock-grass.

Darnel is an annual plant, being in growth and appearance similar to corn, until it puts forth its characters of fructification. It gives little or no trouble, for it generally grows, (where it does grow) thinly scattered, and you cannot weed it out. It is rue that it is seldom found but where it is sown with the seed corn; but where you sow it you are sure to have it in the crop. About the time that corn comes in ear, or rather later, the darnel throws out its lowering panicles, which, as the corn ripens, droop, each spikelet with its heavy load of seeds. These drooping spikelets are somewhat short, and nearly smooth, with the seeds thereon crowded, and the spikelets flat. When ripe, the leaves drop away and the straw looks clear and handsome, much like good bright oat-straw. The seeds resemble the boldest and best seeds of good rye-grass, but are thicker and much heavier; they contain a large quantity of nutritious flour, and fowls, pigs, and horses are very fond of them.

The objection to darnel, which the miller entertains, is that it grinds tough and somewhat soapy, so as to dull the stones. A very plump and dry sample of wheat is readily saleable, though with a little darnel in it, but a sample rough in hand, is lowered very considerably by it. In spring crops of wheat it seldom grows. The name of *drank*, or more commonly *drunk*, is that by which this weed is known in many parts of England.

Cockle (*Agrostemma Githago*), corn campion, is a well-known annual weed, of rather an ornamental appearance, bearing purplish red flowers. In spring its leaves are long, downy, and slender, and the plant is strong and conspicuous at weeding time. It grows somewhat tall before it branches, and is in full flower and bearing when the wheat is ripening, growing two feet and a half high. The seeds are very numerous, and contained in bulky capsules; they are black and rough, resembling a rolled-up hedgehog, and are nearly as big as small wheat kernels. They are filled with white flour, and are very heavy. The miller's objection to these seeds is, that their black husks are so fine as to pass the boulters, and render the flour specky; also, because the seed is bulky; if there be much in the sample, it detracts considerably from the produce in flour; whatever is not wheat must lower the value of that which should be all wheat.

Melilot, (*Trifolium melilotus officinale; Melilotus officinalis*) common melilot clover, is also an annual plant. It grows with an upright stem, about two feet high, branched and furrowed. The capsules containing the seed are very tough and wrinkled, growing in bunches; each capsule is generally one-seeded, sometimes two, but thrashing does not dislodge them: so that in samples of wheat, the wrinkled capsule is called the seed.

This is of all others the most pernicious seed in wheat, a few seeds communicating a very strong smell to flour. The plant is addicted to stiff soils, and often grows on ditch banks in the fences; it blossoms yellow. It is very palatable food to all sorts of cattle, and has a grateful odour when cut down and dried. Nevertheless, as a weed in arable land it cannot be too much guarded against, and ought never to be sown with seed corn. Also it should be sedulously rooted up by weeding in spring; for where it has once got in land, it propagates itself by scattering many seeds before the crop is ripe. Hence wheat, on lands so infested, should always be sown on naked fallow. It must be understood that these hints are given with a view to the common husbandry. Whether it be well or ill-conducted, is a matter very interesting to the cultivator, and also to the public; but if well, the success and produce may be very satisfactory, although drilling and horse-hoeing be not practised.

Tares (*Ervum tetraspermum* and *Ervum hirsutum*) smooth tare, and hairy-tine tare, are two species of wild tares, called the tine tare and the strangle tare. It is said, that on dry soils, in wet seasons, they have overrun and destroyed whole crops of corn. The seeds are small, and every farmer must easily know whether those which have got into his corn be the cultivated tare or not. The miller's objection to these seeds is, that they have a strong taste when ground in the flour. Hence it becomes an important consideration, whether field tares should be suffered to go to seed, or rather to be led off, and ploughed down soon enough to prevent it. Also, for soiling, small patches may be set apart, and seeds at last may be raised therefrom. For it seems to be a doubtful advantage in agriculture, that the introduction of cultivated tares should overrun our fields with new enemies.

The cultivated tares are very common in samples of wheat

and barley, in the market of Peterborough in Northamptonshire. Perhaps in other places they may not yet prevail, and the farmers will do well to avoid them by all means. It must be unpardonable neglect to sow them with seed corn, but if they come of the general cultivation of the plants, the matter is much more serious.

Wild oats (*Avena fatua*), bearded wild oats, or haver; this weed used to abound on stiff clays, in open fields; the fallows were generally abortive, and only brought the land about Michaelmas time in moderate condition for the weed to grow and come up with the wheat. Accordingly such abundance of it would come, that at harvest the whole crop would appear to be wild oats. Wild oats are seldom found but on clays and stiff gravels; on all loose soils, on dryish turnip land, on sandy soils, and on fen and marsh land they are rarely seen. The seed is somewhat larger than common oats, of a dark brown colour, and having a very rough awn or beard. Of course miller's may very well object to them; for when many prevail in a sample of wheat, they occupy a considerable portion of the measure. It does not appear that in spring these weeds can be sufficiently distinguished from the wheat plants to be selected and weeded out, which is also the case with darnel; and it is to be lamented, because the best system can hardly be expected to eradicate those weeds, in regard to which the hoe and the hand cannot be brought in aid of the fallow and row culture. But this ought to be strictly attended to, as being the strongest argument possible why these seeds should not be sown with seed corn. So far, the farmers are masters of these weeds, and it must be a wilful neglect not to act accordingly.

Hariff (*Galium Aparine*). This weed has many names, such as goose-tongue, cleavers, cliders, catchweed, goose-grass, &c. It is said that geese are very fond of it, but geese rarely feed in hedges, where this weed generally grows, unless among crops of corn, where they are not allowed to go. Hariff is a very scrambling weed, and runs to the length of seven or eight feet, increasing in weight of branches and foliage as it obtains the light, and gets through whatever it grows with. It is, however, principally addicted to deep, loose soils, mellow, marshy land, and the drier sorts of fen land. All lightish lands may have hariff, but it abhors clay, and fen soils lying damp and low are not friendly to it. In many clay countries it is probably not known, though it be one of the worst weeds, where it abounds.

This weed increases excessively on loose, deep soils, when once introduced; its seeds are round, with a channel on one side as if rolled up. They are exceedingly rough, and adhere to whatever woollen stuff they touch, so as not to be easily dislodged. They are also heavy enough to resist dressing, and big enough to escape the screen. When roasted they will grind, but raw they are the toughest of all seeds in agrieulture. In samples of oats they are abominable; horses can scarcely grind them.

How to destroy this weed, is how to destroy all annuals, namely, by encouraging the seeds to vegetate, and killing them with the plough. However, as it chiefly infests dry and deep soils, or black mould land, it may be useful to some to shew by what rotation it may be effectually subdued. Suppose a quantity of this weed to grow with a crop of oats; after harvest, as rains come on, the scattered seeds will very numerously vegetate on the surface; this will be much encouraged by getting off the stubble and harrowing; when the opportunity occurs, plough the land a shallow width, and harrow it again. Much surface rubbish may now be raked and carried off, and let the land lie till spring. After spring seeding, plough this piece a seed furrow pitch, and harrow it; clean it from twitch and roots, and let it lie to be green over with annuals. It may then be manured, and the manure immediately ploughed under. After a little harrowing, and hand-picking the twitch, the land may lie till you choose to sow it; the best crop is rape if the land be light, which should be sown rather late (about the beginning of August), and perfectly well hoed and cleaned. The crop may be stocked with sheep in February, but not eaten too close down. The surface as the spring advances, is to be kept clean with hoes, and the rape is to stand to be thrashed; after which the surface must be discharged of the stalks, by pulling, and the land may be sown with wheat at one ploughing. This crop may be cleared with a little exertion by weeding; and in the spring sow the land well down with the best mixture of grass-seeds that can be procured. Though light land does not suit wheat, especially as to quality, yet depth and penetrability of subsoil will generally give you produce enough. It grows too tall and flaggy, and is easily brought down with rain and wind; but if it be clean it will make good seed for other soils, and you can by no other means obtain so much profit, without deteriorating the soil, by any other rotation of crops.

As to the cultivation of dry bottomed and deep black mould lands, short rotations of cropping between longer intervals of grass lay, is recommended. Nothing else could effectually subdue the weeds, which are extremely numerous and ramping in such soils.

Black bind-weed (*Polygonum convolvulus*), climbing buckwheat; this is a weed too often a companion to the last; the same soils grow it abundantly where it has got in by sowing, and it runs to as great a length, getting above the corn that is *laid*, and covering the crop by patches. The seeds are brown, triangular, hard, and smooth, and quite as nutritious as buck-wheat. They are heavy, and large enough to resist dressing, and in wheat samples are objected to for the same reason as cockle. In oats they are really no objection to the buyer, horses being very fond of them. The farmer however has just reason to stand in fear of this weed, from the destruction it brings to his crops, and the injury done to the samples.

Shepherds' needle, Venus' comb, or needle chervil (*Sandyæ Pecten Veneris*), also called beggar's needle, and crow needles, is a bushy and troublesome annual in barley crops. The seeds are long and bent, of a rough texture and brown colour. They are seldom seen in samples of wheat, being a little too short of growth, but barley, when mown, must be infested if they be in the crop, for no dressing can separate them.

Annual snake-weed (*Polygonum Capathifolium*), pale persicaria, called in the fens willow weed, where it is one of the worst that grows. It grows very freely on all loose and deep soils, and on marshy lands, though it be scarcely known to any where clay predominates, and it is as rarely to be seen on proper turnip land, so that the greater number of farmers will not comprehend what plant it is.

It grows from one foot to near three feet high, but more commonly from eighteen inches to two feet. Its stalks are pale, or spotted, or reddish; the joints much swollen, and the stalk appearing tender and succulent (something like that of balsam). It branches much when it has free growth, and produces a great number of spikes of seed. The leaves resemble those of the willow, but are charged with dark spots in the middle. The seeds are very bright and heavy, round one way, but flat and indented on one side; the colour is black. This plant belongs to the same genus in botany with buck wheat and black bind-weed; and its seeds are highly nutritious, and very grateful to birds, especially partridges.

These seeds very much infest samples of fen corn, whether wheat, oats, or barley. The skreen, indeed, discharges much. Those who keep decoys for catching wild ducks, should buy the seeds. Pigs do well on them if boiled. But as a weed, in fen soils, it is the most cumbersome of any that grows. Its seeds abound in the soil, and increase by scattering from each crop, so that in many cases, by spring cleaning, the whole surface is covered with the plants. These are easily ploughed down and the land sown upon the second earth; but often many more appear, and very much injure the crop. All fen lands contain a great deal of it. When they come from grass, that is to be pared and burned, as much as lies to the depth of one inch and a half will be consumed by the fire. Some will grow (with other weeds), in the rape; oats the second crop, at once ploughing, is generally a thick and smothering production, with which not many weeds can contend, and when weeders may do the rest. In autumn sow wheat on the oat stubble, and in spring sow grass soon enough; roll well, and weed well, and if you have not destroyed much willow weed, you have

done the next best thing—you have hindered it from growing.

Charlock is a weed that scarcely deserves mentioning, as respects samples of corn, beause its seeds are so minute that a skreen will separate them completely.

Of the ten sorts of weeds that have been now enumerated, five are principally injurious to wheat—three others are partial, and more common in barley and oats. But many other weeds might be mentioned that infest corn, but by far the greater part are underlings, and little noticed. They are comparatively innocent, and have no common names. Few farmers however, whose knowledge is bounded by the soils they respectively cultivate, would think themselves troubled with more than a dozen to twenty, that is, four or five which trouble him in his fallows, and a few more which are locally prevailing and obtrusive, but, as is too generally considered, *not very hurtful;* hence it has been, that on the different soils, corn poppy, charlock, blue-bottler, corn-marigold, may-weed, &c. have been suffered to abound. Those enumerated above are the most injurious to corn, and require the most patient and systematic measures for their extirpation or suppression, which, as already stated, is by encouraging the seeds to vegetate, and then to kill them with the plough.

## ON CAPE HEATHS.

Some time ago, Mr. M'Nab, Superintendant of the Royal Botanic Garden, Edinburgh, published an excellent pamphlet on the propagation, cultivation and general treatment of this beautiful tribe of plants, which if studied, will be the means to overcome the doubts which many entertain as to the difficulties to be encountered in such operations, Mr. M'Nab having shewn that there is no difficulty in the case, and that Ericas may be as easily brought to perfection in this country as any other Cape plants. He says, "the general mode (and indeed the best mode), of propagating cape heaths in this country, is by cuttings, the greater portion strike root freely, when the young wood is taken, after it has become sufficiently firm; so as to prevent its damping off. The pots for their reception should be about nine or ten inches in diameter at the mouths; fill them to within an inch and a half of the top, with broken pots or coarse ashes, the upper part of which should be of a smaller size than those below; over which should be placed a thin layer of fog (Hypnum) a moss so called, to prevent the sand from working down amongst the draining; then the remainder of the pot should be filled with pit-sand, as free as possible from earthy and irony matter, to the level of the edge, and the sand pressed down very firm. After being well watered, the pot is then fit to receive the cuttings, the length of which must depend on the habit of the species. Some of the free growing sorts may be about an inch and a half long; and others that are of a more stunted growth, may not exceed half an inch; in both cases they should be taken from the plant at the part where the young cutting sets off from the older wood. The leaves should be stripped off about half the length of the cutting, and the end should be cut clean with a sharp knife or scissors; the cutting is then fit to be inserted. Let the kinds selected for the same pot, be as near of the same habit as can be judged, for unless this be attended to, one sort will strike root in a much shorter time than others in the same pot, which makes it very inconvenient when potting them out. When the pot is filled with cuttings it should be well watered with a fine rose watering pot, and placed in a close shady part of the stove, admitting as little air as possible, near to where the cutting-pots are placed, and taking care to water them every day. Bell-glasses are not necessary for heaths in general; some species more difficult to strike, may be put under bell-glasses, and placed in the stove beside the others. Where no stove is at hand to put the cutting-pots in, and if, where they are to be placed there is much air, then bell-glasses are absolutely necessary. The glasses will require to be wiped occasionally, to prevent any damp from injuring the cuttings; and when they have struck root the glasses should be removed gradually, some time before the cuttings are potted out. Cuttings of heaths will strike root when put in at any season, if the cuttings are in a proper state: early in the spring, however, is the best time for them. When the cuttings are rooted, they should be potted into the smallest sized pots and kept for ten days or a fortnight, in a close shaded place; then expose them gradually to a more airy part of the house, shading them from the sun till they are able to bear it. The soil for the first potting should be one half peat, and one half sand; drain the pots well with broken pots or cinders. The second potting must depend much on the season of the year; if the first potting be done in spring, the second should be as soon as the young roots appear round the insides of the pots; but if the first potting be done in summer, then the second will not be necessary until the following spring. The soil for the second potting should be about two thirds peat, and one third sand; and in all the pottings the soil should be a black peat, taken from a dry heath or common, which is never overflowed with water. In general it should not be taken more than five or six inches deep: and where sand is not intermixed with the soil in its original state, about one-fifth of coarse white sand, free from irony matter, should be mixed with it. In shifting heaths from one pot or tub to another, any time from March till August may be taken, as opportunity permits, or the state of the plants may require. Before beginning to shift, I have a quantity of the soil already mentioned, riddled through a very coarse or wide-meshed riddle—if the plants are small, of course the riddle should be smaller. Either broken pots or cinders may be used for draining, whichever is most convenient; there is scarcely any danger of giving too much draining. The plant should be raised a little higher in the pot at each shifting, than it had been before, so that after two or three shiftings the old ball about the stem of the plant should be raised two or three inches above the level of the edge of the pot or tub, keeping sufficient depth between the old ball of earth and the edge of the pot or tub, to hold water. Besides the compost and draining, a quantity of coarse soft freestone, broken into pieces of from one inch to four or five inches in diameter, is introduced amongst the fresh earth in the pot or tub, and pressed down amongst the soil round the ball. The quantity of the stone used to a large sized heath in shifting, would, if broken down to sand, and added to sand previously in the soil, be about one-third of the whole mass. When stones are introduced among the earth in this way, heaths will never suffer so much in the summer from occasional neglect in watering them, as they would do if the stones were not introduced, because these stones retain the moisture longer than the earth; and in the water they allow a more free circulation of any superabundant moisture which may be given through the mass.

"When I mention the treatment heaths should have when in house, I must be understood, that if I have sufficient accommodation under glass, I never would take heaths out of doors, unless it were for the purpose of shifting, or taking them from one house to another. My practice would be to keep them in the house in summer, giving them plenty of air, and to keep them cool during winter. It is a pretty general opinion that by turning them out of doors for four or five hours in summer and autumn, the plants are made hardier, and better able to endure the winter, than they would be if kept within doors during summer. From this opinion I must take the liberty of differing, as I know of no species that will not bear as much in winter, without suffering from it, if kept in the house during summer, as they would do if they were turned out of doors: and many of them (perhaps all), I know will bear more cold in the winter, if kept in the house during the summer, for by the latter practice the young wood gets better ripened, and better able to resist cold in the winter. I would advise every one to keep as many of their best specimens and best kinds within doors, during the summer, as they can, without having them crowded close together. I cannot give better directions than to say that one should not touch the other: if two or three

inches apart, so much the better. The house, however, should be well ventilated at all times, and, except in case of high wind and heavy rain, both top and first lights should be open both night and day; and besides watering the earth in the pots freely when they require it, they should be well watered over head every day, and if the weather is hot and dry, this operation should be performed twice every day; namely, morning and evening.

"It is seldom that heaths are attacked with any insect: the green fly (*Aphis Ericeæ*) is the only one I have observed, and this very seldom; but when it does happen, a little tobacco smoke for a night or two, when the house is kept close, will destroy them, and when it is necessary, it is always better to apply it for two nights in succession, in a small quantity, than to give too much at once.

"If the weather is favourable, a part of the plants may be turned out towards the end of April, if a sheltered shady situation is at hand to place them in. I may mention that at this season they should always be placed in a situation well protected from the easterly wind, for they will suffer much more from it after being turned out of the house in spring, if not more protected, than what they will do from a sharp frost late in autumn. Another part may be taken out in May, and by the middle of June the whole that is intended to be removed for the season. Choose, if possible, a dull moist day for the purpose; or if this cannot be got, place them in a shady situation till they can bear the sun's rays without injury; let them then be plunged in the ground from two to six inches deep, according to the sort of the pots—this saves trouble in watering, and keeps the plants from being blown over; care, however, must be taken to keep the bottom hole in the plant open, so as to let the water pass freely through. Any of the plants out of doors that may come into flower late in the season, should be removed into the green-house, as the heavy rains and high winds injure their appearance when in flower.

"Although I have never seen heaths injured here (Edinbro') when fully exposed to the weather, till after November, it is then necessary to have them removed into the house; and to prevent the heath-house being crowded too early, a part of the duplicates may be left in an open shed, until the thermometer falls seven or eight degrees Fahrenheit below freezing; it is then necessary to move the whole into the house that is intended for them. In all cases, in the middle of winter, heaths will sustain no injury in the house, with the front lights open day and night, until the thermometer falls more than eight degrees Fahrenheit below freezing. I would not, however, advise this to be practised in spring, in case of the same degree of frost happening at that time; for we have often mild weather in February and March, and so much sun that the heaths are forced into a more vigorous state of growth than they are in winter, and when in such a state they will not bear so much cold without suffering from it, as they will do in the early part or middle of winter. I have had the whole heaths in the house frozen for days together, so hard that the pots could not be removed from their places without breaking them, and fresh air constantly admitted at the time, and I have never seen one of them suffer in the smallest degree from it; but on the contrary, found them to thrive better than under any other treatment.

"It is an excellent practice in dull weather in winter, and even in frosty weather, if much damp is in the house, to throw in a little heat during the day; but this should never be done unless the weather is such that plenty of air can be given to the house at the same time, or even when frost is in the house; and the heat should always be stopped before the air be taken off. Very little air should be given during frost; indeed none, except to those which seem to suffer from want of it; but in mild dry weather they should be watered freely with the watering-pot, and the engine should also be used once or twice a week, according to the state of the weather, that is, when it is dry and mild with much sunshine.

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## THE FIG-TREE OF MALTA.

The fifth and last volume of R. Montgomery Martin's History of the British Colonies, published a few days ago, contains those that are in Europe; and in treating of them, he gives, according to the plan he has all along followed, an account of the vegetable productions of each, in the course of his comprehensive and minute work. Respecting Gibraltar he shows that it is not the barren rock that is generally supposed—310 different trees and plants being said to grow on the promontory. In Corfu the olive is the principal production, yielding in favourable years nearly 1,000,000 gallons of oil. The small grape, from which the well known dried currants are prepared, is next in importance. The wild irises are among the most beautiful of the numerous uncultivated plants. The capabilities of the Ionian Islands are very great, soil, climate, and situation, greatly favouring them. Yet with the exception of the currant islands, if those may be excepted, the population is very scanty, and the people generally poor, wretched, and ignorant. Even the olive plants, which, during the best times of the Venetians, constituted the wealth of Corfu, are now its curse. The island is almost overrun with them, and requiring but little cultivation, they have induced idle habits, while they form the most precarious of all crops, and thereby perhaps encourage carelessness.

Of the vegetable productions described in this volume, the Fig-tree of Malta offers the most curious particulars, which we take leave to extract.

"The fig-tree (domesticated and wild) abound in Malta; and some curious facts as to its habitudes and treatment are thus detailed by Boisgelin. 'The *ficus sativa*, or domestic fig-tree, differing in this from other fruit-trees, bears its fruit on the large branches. The figs grow at the origin of the leaves, without having been preceded by any apparent flower, which has occasioned doubts whether the tree produces any. But the flowers are concealed within the fruit, on opening which, at a proper time, we may perceive in the inside, round the crown of the fruit, the male flowers, which are stamina supported by small stylets; and the female, which are situate near the pedicle. These flowers are succeeded by small hard seeds.

"'The fruit of the fig-tree is larger or smaller, more or less round, and varies in its colour, according to the different species of the tree on which it is produced; but it always approaches to the figure of a pear. When perfectly ripe, it is extremely soft and succulent. Naturalists have enumerated thirty varieties of the fig-tree; of which the two that succeed best in cultivation are those that bear the figs universally known by the names of the *round fig*, and the *long fig*. The latter bears most fruit, the former is the earliest; and both are excellent.

"'The fig-tree thrives best, in general, in light soils; but it also succeeds extremely well in stony grounds; and a good aspect renders its fruit more sweet and delicious. This tree is of a very delicate temperament, and cannot withstand the frost, except when covered with straw, or sheltered in a green-house.

"'The wild fig-tree (*caprificus*), resembles, in all its parts, the domestic fig-tree, of which it appears to be, in some measure, only a variety; but it bears fruit that serves for *caprification*, of which the ancients have said so much, but which many learned men have treated as a fabulous, at least useless, operation.

"'This operation consists in suspending in different parts of a domestic fig-tree, several wild figs strung on a thread. The flies or gnats which issue from these, introduce themselves into the umbilicus of the domestic figs, and by their punctures cause in them a fermentation which contributes to their ripening. A careful examination of the history of the white fig has divested this operation of what is apparently wonderful in it, and demonstrated its utility.

"'The wild fig-tree, or *caprificus*, known at Malta by the name of *tokar*, is the *ornos* of the isles of the Archipelago. The three kinds of fruit which it bears in the course of the year, have names in the Maltese language corresponding to those

given them by the Greeks. Thus the *tokarleonel* in Maltese answer to the *fornites* of the Greeks; the *tokarlanos* to the *cratirites*, and the *tokartayept* to the *orni*. *Tokarleonel*, or *fornites*, are the flags of autumn, which appear in the month of August, and continue till November without ripening. In them are engendered small worms, produced from eggs deposited by a kind of gnats, which are only found in the neighbourhood of the wild fig-trees. These worms are a species of very small ichneumons, of a shining black colour. In the months of October and November, having become gnats, they puncture the second fruits or *tokarlanos*, the *cratirites* of the Greeks, which do not appear till the end of September, and which may be called winter figs. The autumnal figs fall soon after the gnats have been produced, but the winter figs remain on the tree till the month of May following, and contain the eggs which have been deposited by the gnats of the autumnal figs. In the month of May, the *tokartayept*, or *orni*, which may be called the spring figs, begin to appear. When they have attained a certain size, and their eye begins to open, they are pierced in that part by the gnats produced in the winter figs; though this is sometimes not necessary for the gnats to introduce themselves into the fig, as they are able to make a passage through the leaves that close the umbilicus. This opening, made by the two teeth, with which the heads of these little ichneumons are armed, afterwards closes, and the eye of the fig does not again open till three or four days before the gnats issue from the fruit. The skin of the wild fig is sleek, smooth, and of a deep green: no puncture of the insects is discernible on the external surface. When near maturity they grow soft, and become yellowish. On opening them, we find their interior construction similar to that of the domestic fig, that is to say, the leaves are in the upper part, nearest to the umbilicus, the stamina next, and then follow the seeds, which are in a kind of kernels filled with small grains, and which occupy the greatest space.

"The wild figs, whatever may be their degree of maturity, have no sweet and luscious liquor; their inside is always dry and farinaceous. When they are become nearly as large as nuts, the gnats make their entrance by the umbilicus, and deposit in them their eggs; roving at first about the inside. All those which these insects neglect to enter in this manner languish, their kernels will not grow, and at length they become dry and shrivelled, and fall off without ripening. Those, on the contrary, that are not fecundated by the puncture of the gnats, visibly increase in size; and the seeds, which are larger than the domestic fig, soon fill the whole inside of the fruit.

"Every kernel of the fig is the habitation of a gnat; and if the integument of the seed in which these insects are inclosed be opened at a proper time, they will come out, and after having dried their wings in the sun for a few minutes, fly away. On examining their kernels before the fig is perfectly ripe, we discover on their surface, with the aid of a strong magnifier, some small brown spots, imperceptible to the naked eye; and after having detached the upper part with very fine scissors, we perceive some *living particles*, that is to say, well-formed *nymphs*. As soon as the small worms are disclosed, they pierce the yet tender membrane of the seed, feed on the kernel it contains, and remain there as in a habitation very convenient for their metamorphosis. These worms are never found roving in the inside of the figs, but after having thus lived a certain time under this form, they are metamorphosed into gnats, having a long auger in the hinder part of their bodies.

"These insects, from their retired situation, and their extreme minuteness, it would seem must be exempt from enemies; they have, however, two very formidable to them. One is a small ichneumon, of a cinnamon colour, with a very long auger; and the other an insect with a scaly head and corslet; its hinder part is formed like a tail annexed to the corslet; and its head, which only adheres to the body by a very small ligature, is armed with two teeth. These likewise have their lodgement in the kernels of the fig, like the other gnats. The latter species does not appear to be intended to fly: it leaves the eye of the fig, without becoming a winged insect.

"There are seven or eight different species of fig-trees at Malta, but caprification is only used for two of them.

"The first gives two gatherings in the year, one in June, when the figs which do not ripen till the latter end of the month are succulent and larger than in France; the other in August, when the figs are gathered during the whole course of the month, and are less delicate and smaller. The earlier ones do not require, like the latter, to be caprificated.

"The second species, the same with that which is so fruitful in the isles of the Archipelago, bears only once a-year: the figs are small, of a whitish colour, and sweet, without much taste.

"But whence arises the necessity of caprificating these two species of fig-trees more particularly than the others? It is certain that the tree of the first species which has produced a great quantity of large and succulent figs, is, so to speak, exhausted, and has not strength to furnish sufficient nourishment to the second figs, which begin to appear at the time when the first are ripe; consequently these second figs not receiving the nutritious juice necessary to them, will fall before they are ripe; and this inconvenience can only be remedied by caprification. The introduction of the gnats causes a fermentation in them which accelerates their ripening, in the same manner as worm-eaten fruits always ripen before those that are sound. Hence the figs which would be two months before they would be ripe, will be fit to eat three weeks earlier; and when the time of their fall is arrived, the quantity will be much greater. Many individuals do not caprificate their second figs, to avoid fatiguing their trees; for experience has shewn, that the crop of first figs is usually bad in the year following caprification, because the fig-tree has been forced to nourish too great a quantity of fruit in the same year.

"Let us now examine what are the reasons for the caprification of the second species of figs. They are the same as in the former case though the object of the operation is different. I have already mentioned the quantity of fruit which this tree bears: it is such that frequently the branches cannot be seen on account of the figs with which they are loaded. When the caprification of this kind of fig-tree is neglected, a great quantity of the fruit falls off before it ripens, because the tree is overloaded with it. The difference of the produce of a caprificated tree from that of another which has not undergone this operation, is immense; since a fig-tree which would scarcely yield 25 pounds of figs that should be ripe and proper for drying, will in consequence of this mode of treatment, produce more than 280 pounds.

"It is to be observed that the figs which are not caprificated artificially, but only by the accidental removal of the gnats from one fig-tree to another, are much preferable to others: whence it is that the figs of Provence, where the practice of caprification is unknown, notwithstanding the same species of fig-tree is cultivated there as at Malta and in the Levant, are much superior to the dried figs of the Archipelago. It is also to be remarked that the heat of the sun, which is sufficient to dry the figs that have not been caprificated, is not so for those that have undergone this operation. They must be dried in the oven; which gives them a disagreeable taste, but it is necessary to destroy the eggs of the insects which they contain."

As to another alleged fact, we find it said—

"It now only remains for me to refute an error too commonly received, viz, that the wild fig-tree is the male of the domestic fig-tree. Pontedera, who conceived this idea, supposes that the former furnishes the farina, or dust of the stamina, necessary to fecundate the fruits of the latter; and that the gnats are the bearers of this dust, which they deposit in the figs into which they introduce themselves. But had he attentively considered the gnats when they first come out of the wild fig, he would have seen that they are, indeed, then covered with a white dust, derived in part from the stamina through which they have made their way, and from the inside of the fig, which is farinaceous; by continuing his observations, he would also have perceived, that immediately on their leaving the fig they employ six or seven minutes in drying their wings

in the sun, and in disengaging them from the dust with which they are encumbered; and that when they take their flight, not the slightest vestige of this dust remains, but that they are of a shining black colour when they make their way into the domestic figs. This fact entirely subverts the principle on which this observer and his partisans appear to have founded their system of fecundation."

## SINCLAIR'S HISTORY AND DESCRIPTION OF DAHLIAS.

THREE Numbers of this splendid, we may say magnificent work, are now before us, nor do we think we can do better than to copy the introduction to it, which, by no means, oversteps the truth.

"The object of the following work is to bring into notice all the choice and leading varieties of the Georgiana, or Dahlia, now in cultivation. Such has been the wonderful increase of this beautiful tribe of plants, that there are now among the London florists, nurserymen, and amateurs, upwards of six hundred distinct varieties of double dahlias, the colours of which are of the richest possible hue and of an endless variety. Yet there has never been any work wholly devoted to the dahlia. We, therefore, undertake the following work from the consideration that a flower so extremely beautiful in itself, and now become a general favourite, richly deserves a work wholly devoted to its history. Although there have been so many distinct varieties of the dahlia raised of late years, the number of choice sorts fit to please the eye of the florist or amateur is yet but limited. The subjects chosen to illustrate this work, are those only which are considered really good, and which form the first class of show flowers. The work is to be continued monthly, each number is to contain four varieties faithfully drawn and coloured from nature, accompanied with such concise details and descriptions as will be calculated to promote the growth and culture of the dahlia among all classes. It may be necessary to state that no care nor attention will be wanting in selecting the choisest sorts for illustration, as we are well aware that some of the sorts which we now hold in great estimation will yet give place to others still more beautiful. The sorts intended to illustrate this work will be carefully selected from the richest collections in England, or perhaps in the whole world; viz., from the splendid collections annually exhibited by the Metropolitan Society of Florists and Amateurs, and the South London Floricultural Society. The rise and progress of such unrivalled exhibitions, have doubtless been the cause of floriculture being carried to that point of perfection it has now attained. The drawings for this work have been taken from living specimens of the same approved sorts as have been shown at the above exhibitions.

"Although this undertaking does not require the grace of a Corregio, or the magic touch of a Raphael or a Rubens, yet, as we hold all the sacred works of nature in the highest veneration, and being well aware of the great brilliancy, the glowing richness and harmony of colour, the soft gradation of shades so admirably pictured in every variety of this beautiful flower, it is with the utmost diffidence that we attempt such an undertaking.

"Amongst all the beauties of the flower garden which delight the eye, or which have attracted the attention of the florist of late years, there is none that surpasses the grandeur and magnificence of the dahlia. It is to be valued more as it continues to send forth its beauteous blooms in rapid succession, for three whole months, and that at a time of the year when before its introduction, there were but comparatively little to be seen in the flower garden.

"There is no end to the new varieties of this plant that may be raised from seeds, of which fact we have ample proofs each successive season. To draw any conclusions as regards the number of distinct varieties would be wholly impossible, as every florist has got his own favourite sorts, and keeps adding choice sorts yearly, and destroying other inferior varieties.

"It remains for us only to state that a close imitation of nature is what is aimed at by this work; and we flatter ourselves that by taking due care to avoid any preposterous floridness of colour, and having recourse to the art of lithography, the greatest invention of the nineteenth century, and the new method of printing in colours lately adopted by foreign artists, and which can be applied with the greatest advantage to the dahlia--we will be enabled to produce a work that will not be unworthy the notice of the numerous warm admirers and cultivators of this beautiful flower."

We also quote as a specimen of the concise description given of each variety, what is said of Widnall's Granta.

"Raised by Mr. Widnall, nurseryman and florist, at Grantchester, near Cambridge, a very extensive cultivator of the Georgiana. He has also raised some very choice sorts, viz., Emperor, rich dark maroon, striped with crimson; Lady Anne Cooke, white, finely edged with purple; Magnum Bonum, crimson, richly shaded with puce; also Othello, Pactolus, Paragon, Phyllus, Pizarro, Rossa Mundi, and Venus. The prefent variety, Granta, is extremely beautiful, the flower being an excellent shape, colour dark claret, with cupped petals. It may be proper to state that such has been the increase in Mr. Widnall's collection of the Georgiana, within these last three years, that he has discarded two hundred varieties of named dahlias which had previously been considered fine flowers. This fact furnishes us with a wonderful proof of the rapid increase of this tribe of plants.

Mr. Sinclair's directions on the choice of Dahlias, will be found by all cultivators of this gorgeous tribe of flowers, to be remarkably distinct and accurate.

"The chief property of a good dahlia lies in the form of the flower and the brilliancy of the colours. Those who are already acquainted with the nature and habits of the tribe can at once discover the good properties of any new seedling dahlia, by comparing the form of the flower with that of variety Widnall's Perfection, Metropolitan Perfection, Granta, Criterion, and a few others we might mention. The great object of florists is to make the flowers bloom with what they term good eyes; that is, the centre of the flower ought to be filled up with petals, so as to hide the yellow speck that is to be seen in the centre of a single or semi-double dahlia. Although this spot contains the principal organs of fructification, the rudiments, as we may say, perhaps, of a choice variety, yet the florists and those who exhibit the dahlia at floricultural meetings, have excluded from their stands all those blooms having what they term scaly eyes, let their other good properties be what they may.

"To lay down any other criterion of a choice sort, by referring to the above varieties, would be almost useless. We might mention that the properties of a good flower lie in having the petals without a fringe or serrature of any description; but until dahlia culture has arrived at a higher point of perfection than it has yet attained, this cannot in justice be done without excluding some of the most favourite flowers.

"It often happens that where the petals approach nearest to perfection, there is some defect in the eye; and when the eye is perfect, there is some defect in the other petals. In the variety Criterion, which may be classed as one of the leading flowers, we have an example of this. The flowers of this variety, in nine cases out of ten, do not bloom without showing the eye. Such is the proneness to variation inherent in most of the dahlia tribe, more especially in those where two or three colours are blended together, that to produce a drawing fit to please some of the florists is extremely difficult. To please the eye of a certain class of florists by any human effort is altogether impossible. Were Van Huysum to start from his grave, and all the painters who have existed since the days of Noah, they would fall short of pleasing them: even the inimitable touches

of nature, to which no human art can ever approach, does but barely satisfy them. We would admonish such by asking them to wait with patience and see what may occur in the field of floriculture a few years hence, for our belief is that we are only in the dawn of the dahlia era. We hail the day when, through the exertions of a few intelligent florists and amateurs, 100 distinct varieties will be produced equal in form to the variety Grandis, exhibited at Vauxhall Gardens, September 17, by Mr. Denniss. Then we may say *Labor omnia vincit*. We however have no doubt, that from the rapid strides that dahlia culture is now making throughout Britain, but that hundreds of our most favourite sorts will yet give place to hundreds still more beautiful."

One of Mr. Sinclair's correspondents has furnished him with a sketch of a classification of the Dahlia, according to a judicious arrangement; a description of which, in that correspondent's own words, may be sufficiently plain to many, without the accompanying figures.

"Having lately seen a number of your new work on the Dahlia, which is likely to become a standard work on one of the brightest ornaments that ever graced the flower garden, I take the liberty of submitting to your inspection the following attempt to classify the different varieties of this beautiful tribe, according to the formation of the flower and the arrangements and shape of the petals. It has often occurred to me, and not without good grounds, that a want of judgment and good taste is prevalent among many florists, amateurs, and others, who exhibit Dahlias for prizes at the different floricultural meetings throughout the kingdom, in not having their stands of flowers arranged according to the formation of the flower as well as the colour. It must be obvious to every admirer and exhibitor of the Dahlia, that 12 or 24 blooms of the same form in every respect, with the exception of colour, must have a much better appearance than 12 or 24 arranged in the usual manner. It is nothing uncommon to see the flower of a Granta placed by the side of a Rising Sun, or a Metropolitan Perfection by a Beauty of Cambridge. I have, therefore, endeavoured to divide the Dahlia into eight classes, which are as follow :—

1. Queen, Cedo Nulli &c.
2. Albidum, Lady Fordwich, &c.
3. Those that resemble Granta, Springfield Rival, &c.
4. Countess of Liverpool, and all turban-shaped flowers.
5. Grandis, Marquis of Abercorn, &c.
6. Tarront's Invincible Glory, &c.
7. Shannon, Homer, &c.
8. Metropolitan Perfection, Dennissii.

"Such is my arrangement of the Dahlia. In my opinion were a similar system adopted at every Dahlia exhibition, it would tend to facilitate the awarding of prizes for the best specimens, without the least trouble.

"J. NAIRN."

## LOUDON'S ARBORETUM BRITANNICUM.

The more we see of this work, the more we are convinced of its value, and the riches of the information it contains. The author invests shrubs and trees with an interest, as if he were treating of tribes of the human race. We verily believe that Mr. Loudon feels often as if trees reciprocated with him a sort of enthusiastic friendship. But besides the kindly feelings towards these inhabitants of the fields, the mountains, and the wilds, the precise knowledge here exhibited of the home of each tribe in this and foreign countries is upon an extent that we never anticipated could be attained in any one work. It is quite clear, however, that the advertisement which announces the plan and nature of the work is more than fully sustained by what has already appeared of it, under the first branch of its division; and as we look upon the "Arboretum Britannicum" as a publication which will give a new impulse to the study and culture of trees in this country, as well as in foreign parts (for under the direction of the author it is to be translated into French, German, and Italian), the copy of part of that advertisement, which we now introduce, it is to be hoped will contribute to the popularity of the performance.

The Arboretum Britannicum then contains portraits from nature, to a scale of a quarter of an inch to a foot, of all the trees which endure the open air in Britain, of the sizes which they attain in ten years in the neighbourhood of London; with botanical figures in flower, and in fruit and seed.

The letter-press contains, first, the history of the introduction of foreign trees and shrubs into Britain, with notices of the trees and shrubs of temperate climates throughout the world.

Secondly, the study of the organization, physiology, physiognomy, &c., together with whatever relates to the culture and uses of trees, will be treated of.

Thirdly, the application of the theory laid down in part second, will be made with the trees individually.

Fourthly, the formation and management of ornamental plantations, and the stastics of trees will be handled.

The eighth and eleventh numbers of the work, which are now before us, show, under the first head, how completely the announcement is made good, which promises to give the history of the introduction of foreign trees and shrubs into Britain, and other countries, as the following extracts prove. Here is an enumeration of some of the principal planters of arboretums, and places where they were planted during the present century; the lists belonging to plantings during former periods are elsewhere discussed.

"Among the planters of aboretums in Great Britain during the nineteenth century, the first place belongs to George, fourth duke of Marlborough. This nobleman, when Marquess of Blandford, resided on the estate of White Knights, near Reading, from the year 1800 till he succeeded his father in 1817. About 1801 he began to collect plants of every description, built numerous hot-houses for the exotics, and occupied a large walled garden with the hardy herbaceous plants, and the more choice trees and shrubs. Soon after, finding this garden too limited, he employed as an arboretum, a space of several acres, called the Wood; and throughout the park at White Knights he distributed many trees, and a collection, as extensive as could be then procured, of the genus *Cratæ'gus*. About this time magnolias, rhododendrons, azaleas, and other American trees and shrubs, being rare, or newly introduced, bore enormously high prices; but price was never taken into consideration by the Marquess of Blandford. He was never content with one plant of a rare species, if two or more could be got; and the late Mr. Lee of the Hammersmith Nursery informed us, that he had sold several plants of the same species to the marquess when they were at twenty guineas, and even thirty guineas each. In consequence of a similar mode of proceeding in his transactions generally, the Marquess of Blandford soon found himself involved in debt and lawsuits, which, since 1816, have greatly crippled his exertions. He has still, however, the same taste for plants, and indulges it, as far as his limited sources will permit, in the pleasure-grounds of the palace at Blenheim, where His Grace at present resides. White Knights is now chiefly remarkable for its magnolia wall, which is 145 ft. long and 24 ft. high, entirely covered with twenty-two plants of *Magnòlia* grandiflora, which flower every year from June till November. They were planted in the year 1800, when the price in the nurseries, for good plants, was five guineas each. In the Wood there are a great number of remarkably fine specimens of all the species of *Magnòlia*, and especially of M. auriculàta and acuminàta. There are also very fine trees of *A'cer* rubrum, saccharinum and striàtum; of *Æ'sculus* and *Pàvia*, of *A'rbutus*, of *Kölreutèria*, of *Virgília*, of *Córnus* flórida, of *Gledítschia*, *Céreis*, *Cratæ'gus*, and *Photínia* 15 ft. high; some of the finest trees of *Pyrus* nivàlis and bollwylleriana in the country; of *Halèsia*, *Dyospyros*, *Nyssa*, *Gymnócladus*, *Plánera*, *Jùglans*, *Stuártia*, *Laúrus*, *Quércus*, *Juníperus*, *Thùja*, a remarkably fine *Cunninghàmia*, and many pines, among which are the greatest number of *Pinus Pallasiàna* to be found together in any grounds in England. *Pinus*

*Cémbra* has here attained the height of 30 feet in 35 years; and *Làrix* péndula that of 50 ft. in the same time. At Blenheim the duke has introduced the finest trees he could procure, in numbers and in masses, as far as he was enabled to do so; and Magnòl*ia* conspícua, of which seldom more than one or two plants are to be found in any one demesne, may be there reckoned by dozens.

"William Beekford, Esq., of Fonthill Abbey, began to plant at that place all the rare trees and shrubs which he could procure, about the same time as the Duke of Marlborough planted White Knights. He paid no attention to house or to herbaceous plants, but, like the duke, planted the choicest trees and shrubs, in quantities, without any regard to their cost; paying for them, we believe, in ready money. We had the satisfaction of inspecting the grounds at Fonthill twice in 1806, when they were in their highest beauty and keeping; and we spent two days in looking at them again in 1833, when they were in a state of neglect, and when the greater number of the rare trees and shrubs, and in particular the pinetum, thornery, and rosary, were almost obliterated by the growth of common trees and shrubs. There are still some fine magnolias, rhododendrons, and azaleas in the American ground, which have been hardy enough to cope with the native trees which have been planted, or have sprung up fortuitously around them. The scenery of Fonthill has somewhat of a Swiss character, from the hilly ridge on which the Abbey is built, and the prevalence of the pine and fir tribe in the woods; and in it there is an air of melancholy grandeur, unlike that of any other place that we are acquainted with in Britain."

Several public bodies have commenced arboretums during this century, throughout the united Kingdom. Nor have the nurserymen been wanting in this work of advancement. One example may be selected.

"Pre-eminently among them stand the Messrs. Loddiges of Hackney, who have been assiduously collecting trees and shrubs from all parts of the world, since the middle of the last century; and in the year 1818, when these amounted to above 1200 species and varieties, exclusive of azaleas, roses, and willows, they were arranged alphabetically on the right hand side of a walk forming a scroll like the Ionic volute, extending over a space of upwards of seven acres, commencing with the letter A, at the outer circumference, and terminating with Z (Zizyphus) near the centre. The centre itself, forming the eye of the arboretum consists of ten concentric zones, devoted to peat earth plants, commencing in the outer zone with Andrómed*a*, and terminating in the inner one with *V*accînium. The collection of willows, which is very extensive, is placed by itself in the circumference; as is also the collection of yuccas. The collection of roses, which exceeds 1500 sorts, is planted on the left hand side of the scroll walk, and their number being about the same as that of the trees and shrubs which do not require peat earth, they extend to the commencement of the concentric zones. The surrounding boundary walls are covered with half-hardy trees and shrubs. In 1830 this arboretum was in a high degree of perfection, and in the autumn of that year we had sketches taken of all the trees and shrubs, to the scale of $\frac{1}{4}$ inch to a foot. As the object of Messrs. Loddiges was to include in one place, not only specimens of each particular tree and shrub, but also stools for propagating them, and a stock of young plants for sale, all placed beside the specimen plant, it became necessary to cut down the specimens as soon as they had attained a certain size; and this was accordingly done with many of the timber trees in 1832 and 1833. To us this has been an incalculable loss, because it has prevented us from examining many of the trees in flower; but the stools or young plants still remain, and the collection is increasing every year. So spirited an undertaking cannot be sufficiently appreciated; and it is only to be regretted that the want of a separate piece of ground for containing the stools and the plants for sale, rendered necessary the felling of a collection of specimens such as could be found assembled together nowhere else in the world."

The author proceeds to give the history and the geography of the trees and shrubs of the continent of Europe, displaying a research, which we believe no man in this country, but Mr. Loudon, whose past labours have doubtless afforded him unprecedented opportunities in this way, could rival.

"The continent of Europe has supplied, as we have seen in the preceding chapter, a considerable number of trees and shrubs to the British Arboretum. The different countries which compose it have been so thoroughly explored by botanists, that few farther additions can be expected from them; but it will be, nevertheless, interesting to examine the indigenous ligneous flora of each as compared with that of Britain, and its capacity for receiving additions from the trees and shrubs of other parts of the world. We shall take these countries in the order of France, Holland, and the Netherlands, Germany, Scandinavia, Russia and Poland, Switzerland, and Greece, Italy, Spain, and Portugal; and, considering the subject as one of secondary interest to that of the preceding chapter, our observations on it will be brief."

France contains, it would appear, the richest indigenous ligneous flora of any country in Europe, 346 trees and shrubs being indigenous to France that are not so to Britain; "and this number, added to that of the woody species considered as decidedly indigenous to Britain, and supposed to be also indigenous to France, would give a total indigenous ligneous flora to the latter country of 546 species. The number of indigenous timber trees which exceed the height of 30 feet in Britain appears to be 29; those indigenous in France which exceed that height are, according to the introduction to Michaux's *Arbres de l'Amérique*, 30; but, according to the *Botanicon Gallicum*, they are 34. If we add to the indigenous woody plants of France those which are cultivated or doubtful, the total ligneous flora of that country will be above 580. If to this number we add the 528 trees and shrubs of North America (see p. 126.) all of which will grow in France, it will give a total ligneous flora to that country of above 1,100 species; which, considering that France possesses in her botanic gardens or nurseries all, or nearly all, the trees cultivated in the open air in Britain, is probably as near the truth as the present state of our catalogues will admit of our arriving at. In the above enumeration of the woody plants of France, we have, as in the case of the enumeration of the woody plants of the British Islands (p. 27.), including all the under-shrubs, and also all those reputed species which we believe to be mere varieties. We have included the under-shrubs, because it is difficult to draw a line of separation between those which might practically be considered as herbaceous plants, though botanically they are suffruticose; and because, in a state of culture, some of these suffruticose plants attain such ample dimensions, and such a ligneous texture, as to assume quite a shrubby character; for example, *E*uphorb*ia* Charàcias in Britain (p. 29), and *I*bèris saxàtillis in France (p. 132.). The first is seldom above 2 feet high in its native habitat in woods; and the second is seldom above 6 inches high, on rocks and in gravelly soil; but in dry deep garden ground the euphorbia will, in the course of a few years, form a bush between 3 feet and 4 feet high; and the iberis a mass above half that height. We have inserted the names of what we consider only varieties, because we have no doubt that, in most cases, they are plants tolerably distinct; because it is impossible to be quite certain of what are species and what varieties, without comparing them in different stages of their growth, and grown in the same soil, situation, and climate; and because we do not wish to set up our own opinion in this matter as absolute.

"In an article by Professor Thouin, published in the *Memoires d'Agriculture* for the year 1786, it is stated that France then possessed about 84 different species of trees, of which 24 were of the first rank in point of size, or exceeding 100 feet in height; 16 of the second rank, or exceeding 60 feet in height; and the remainder of the third rank, or exceeding 30 feet in height. The names of these trees, and their arrangement according to the heights they attain, will be found in the work last quoted,

and also in the *Nouveau Cours Complet d'Agriculture*, edit. 1821, art. *Arbre*. Deleuze states that France contains about 250 species of trees, of which more than three fourths are of foreign origin. (*Annales du Muséum*, tom. iii. p. 191).

Ample as is the ligneous flora of France, it might be doubled by adding to it the trees and shrubs of Australia, of the mountainous regions of Asia, and of Mexico, Chili, and Peru. We do not speak of the whole of the trees and shrubs of these countries, because the whole are not yet known, but only of those that have been already introduced into Britain, and are treated by us as green-house plants; all of which would succeed in the open air of the southern provinces of France. Were the total number of ligneous species from these countries introduced, the number of trees and shrubs now in France would, in all probability, be quadrupled.

"But though the ligneous flora of France is so much more extensive than that of Britain, yet it is far from being so equally spread over the country. Paris is considerably to the south of London, and yet there are above fifty species of evergreen trees and shrubs which are to be found in the open air in the environs of the latter city, which are not to be found in those of the former. We assert this from a comparison between a list of the trees and shrubs now (1835) growing in the *Jardin des Plantes* at Paris, furnished to us by Professor Mirbel, and the list which we have seen in MS. of the trees and shrubs now in the garden of the Horticultural Society of London. No part of France is so far north as Edinburgh; yet, while the cedar of Lebanon attains a large size far to the north of that city, and even in the Highlands of Scotland, it is killed during severe winters at Strasburg and throughout Lorraine. Nevertheless, the fig and the vine ripen their fruit, and many deciduous foreign trees flower far better in the open air in the neighbourhood of Paris than they do in that of London. There are probably few plants that will endure the open air in the south of France, that might not be kept alive in the open air all the year in the southern extremity of Ireland, or in the neighbourhood of Penzance in Cornwall, though they would, probably, never flower at either of these places. The cause is so well known as to be hardly worth repeating: the summers in France have, proportionately to the latitude, more light and heat than those of Britain, and the winters less heat."

The first foreign trees may probably have been fruit-bearing species, introduced by the Romans into France; but the principal accession to the ligneous flora of that country, is stated to have taken place from its connexion with North America, that is, about the middle of the eighteenth century.

"We may remark that there are few large and old trees in France comparatively with what there are in England; not only on account of the great changes which landed property has undergone in France, but because trees in that country are grown principally for timber and fuel, and have at no period been considered so much articles of luxury as they have been and are in England, which is supplied with timber for building from the Baltic, and with fuel from its coal mines.

"The knowledge which we in England possess respecting the culture of trees in France may be said to date from the publication of the *Traité des Arbres et Arbustes*, by Du Hamel, in 1755. Du Hamel was contemporary with Miller and Collinson of London, and was in general correspondence with British botanists, to whom, in common with botanists in other parts of the world, he, in the preface to his work, acknowledges his obligations. In the first and second editions (in 2 vols. 4to.) of his *Treatise*, he describes 180 genera, and nearly 1000 species, without including those small under-shrubs, such as thyme, hyssop, &c., which technically are ligneous plants; and in the third edition, known as the *Nouveau Du Hamel* (in 7 vols. folio), which was published from 1800 to 1819, nearly 2000 species and varieties are described, of which upwards of 500 are figured.

Du Hamel, in the preface to his work, says that he has treated of shrubs as well as trees, in order to lead to the pursuit of the useful through the medium of the agreeable. 'There is reason,' he says, 'to hope that we shall be better listened to by the rich, when we propose to ornament their mansions with foreign trees, and their parks with thickets of flowering shrubs, than if we were simply to tell them to form plantations on lands unfit for producing corn or grass. If the self-love of the posessors of country seats is flattered by the view of common parks, notwithstanding the revolting uniformity of their thickets, which are only varied by differing in size or in form, is there not reason to hope that they will be much more highly gratified when the thickets in these parks offer that variety which is produced by different kinds of trees and shrubs, and which exhibits beauties suited to every season?' After giving directions for choosing flowering trees and shrubs to form thickets for the early part of spring, for the middle of spring, and for summer, he next shows the superior enjoyment to be derived from the culture of trees, to that which can be derived from the culture of herbaceous plants. 'The most beautiful bed of hyacinths or tulips, when the flowers have once faded, leaves nothing but what is withered and unsightly; whilst the flowers of trees and shrubs which generally appear in spring, are succeeded by the most vivid green leaves; and even in winter, after these have dropped, the ramification of the branches and spray is beautiful and interesting.'" (Preface, p. xviii.)

The indigenous and foreign trees and shrubs of Holland and the Netherlands "are very few, partly from the limited extent of territory, but chiefly from the great uniformity of the surface, the soil, and the climate. The only *Flora* which has been attempted of Belgium is that of Lejeune and Courtois (reviewed in *Gard. Mag.*, vol. x. p. 449.), of which only a part has been published. Holland can hardly be said to have an indigenous ligneous flora; but into that country foreign trees and shrubs were introduced as soon as they were into any other in Europe. The botanic garden of Leyden, and its earliest catalogues, may be referred to as a proof of this; but for its history, and for various details relating to the subject, we must refer to the *Encyclopædia of Gardening*, edit. 1835, p. 69. M. E. de Wael' the director of the botanic garden at Antwerp, has furnished us with a list of the indigenous trees and shrubs of that neighbourhood, which is even more meagre than we had anticipated; and another correspondent has sent us the following remarks on the subject of the Dutch ligneous flora. 'Many causes combine to operate unfavourably on the growth of trees and shrubs in Holland; the numerous heavy winds in the neighbourhood of the sea, and more particularly the north-west wind, destroy the tops of the high-growing trees, break their branches, and, by shaking their trunks, loosen the roots in the soil, or blow the trees down. This is chiefly occasioned by the little depth to which the roots can penetrate into the ground; for, as soon as they reach the water, they are compelled to take a lateral direction, in consequence of which the trees soon become sickly, or are suddenly loosened from the soft, loose, humid soil by the wind. We have here much marsh and fen land. This soil, which is extremely well adapted for supplying turf or peat, is unfavourable to the growth of timber. Should much rain and strong winds occur, the trees on this soil cannot exist long enough to become old, nor even to have good trunks. In order, therefore, to prevent their being blown down, they must, from time to time, be tied or propped up: but the trouble and expense of this operation cause it to be neglected; instead of it the trees are severely lopped, and this, by causing them to throw down a greater quantity of roots into the wet substratum, only renders them more sickly. The truth of this fact may be perceived in the trees in and about most of the Dutch cities. When these obstacles do not occur, the trees exhibit a better growth; for the elms on the embankments in Zealand, which have their roots in a good stiff clay soil, and stand high out of the water on the dykes, endure the sea winds without sustaining any injury; besides which, these trees are judiciously pruned,

and this, of course, greatly contributes to their large growth and handsome appearance. Whenever the trees are on high ground, and grow in masses, so as to protect one another from the winds, the vegetation is luxuriant, as is the case at the Hague, and in the woods near the Loo. This strikes even a superficial observer at the first glance.

" 'Most of the country seats in Holland were formerly near Rotterdam, along the Gravenwej, for example; and at Amsterdam, in the neighbourhood of the Diemermeer: but, as all these seats have been demolished, and new ones formed in the high sandy grounds of the provinces of Guelderland and Utrecht, not many remarkable old trees remain in the former district. Those which time might have spared have been cut down in consequence of the removal of the country seats. The Pópulus canadéneis [? monilífera] appears every where here in an excellent condition, and grows in places where no other tree will thrive. On the sites of some of the old country seats, especially where the ground is elevated, old tulip trees and catalpas are found, both of which bloom freely. The new country seats are laid out with much taste, in parks on a large scale, and on high grounds, in the provinces of Utrecht and Guelderland; and they are planted with exotic trees and shrubs, which afford very favourable expectations for the future.

The modern collections in Germany are numerous. As to Austria, " there is an excellent collection in the University Botanic Garden of Vienna, under the care of Baron Jacquin, chiefly planted within the last twenty years, but a part much older. Here the macluras, male and female, stand in the open air, but require protection during winter. The salisburia here, and those in several other places near Vienna, flower annually; but they are all male plants. On that in the Botanic Garden, Baron Jacquin has had the female grafted with scions from Geneva, but they have not yet flowered. Saxenburg is more remarkable for native trees than for foreign ones; but there are some very large tulip trees, which ripen their seeds every year, and some very large purple beeches and weeping willows. There is there an *Araucària* excélsa, protected during winter by a wooden house, which has attained the height of 30 feet in six or seven years. Baron Jaquin assures us that this is one of the finest and most picturesque specimens of this tree that can be imagined. In the park there are many fine oaks of the growth of several centuries; and a very comprehensive general collection of trees and shrubs, of from ten to forty years' growth. All these have been planted by, and are now under the care of, M. Stephen Rauch, through the exertions of whose son, M. Charles Rauch, now head gardener at Rennweg, we have received much of the information contained in this section; while another son, M. Francis Rauch, now (1835) in London, has drawn from nature the greater part of the botanical specimens by which this work is illustrated. In Austria Proper there are collections at Bruck on the Leytha, on the borders of Hungary; at Dornbach, Prince Schwartzenberg; at Hadersdorf, Baron Loudon (a view of whose mansion we have given in the *Encyclopædia of Gardening*, edit. 1835, p. 136, fig. 87.); and at the nurseries of Rosenthal, and Held in Vienna.

## DESCRIPTION OF THE PLATES.

### PODALYRIA BIFLORA.

TWO-FLOWERED PODALYRIA.

Decandria Monogynia.

Gen. Char.—Calyx sub-bilabiate, five-fid. Corolla papilionaceous. Legume ventricose, many seeded.

Spec. Char.—Leaves simple, ovate, sub-tomentose; peduncles two-flowered.

Stalk shrubby, branched; younger branches downy, round; leaves sharp at both ends, with a small acuminate reflexed point, silky on both sides, with silvery adpressed lines; margin rust-coloured, nearly sessile; petiole very short; peduncle nearly terminal, twice the length of the leaves, divided into two pedicles, each having a thick blunt scale or bract at the base, and supporting a large white flower, that changes reddish with age. Calyx three-toothed, sub-bilabiate, hollowed at the base as if the footstalk was pushed in, covered with a rust-coloured tomentum; corolla papilonaccous, stamens distinct, inserted in the receptacle; anthers yellow; ovarium ovate.

It is sweet-scented, especially after sun-set. Native of the Cape of Good Hope; flowers in June, and requires the shelter of a green-house.

### CORONILLA EMERUS.

SCORPION SENNA.

Diadelphia Decandria.

Leguminosæ.

Gen. Char.—Calyx two-lipped, two-three-parted, upper-teeth connate; vexillum scarcely longer than alæ; loment round, jointed, straight.

Spec. Char.—Peduncles about three-flowered; claws of corolla three times as long as calyx.

This is a shrub of low and slow growth; one that grows in the Apothecaries' garden, Chelsea, which grew there in the time of Miller, is now not more than five feet high. Its blossoms are produced in May and June, and sometimes again in autumn; neatly trained to a wall or paling, it makes a beautiful appearance when in flower; the shortness of the shoots renders it a very proper object for that purpose.

The leaves, by a proper fermentation, are said to produce a dye like that of indigo.

It is a native of France and Germany, and a very old inhabitant of our gardens, having been cultivated by Gerard in 1597.

It is propagated by seeds, layers, and cuttings. The first are not produced in any great plenty with us.

### LEUCADENDRUM STRICTUM.

UPRIGHT LEUCADEN DRON.

Diœcia Tetrandria.

Proteaccæ.

Gen. Char.—Male.—Flowers capitate. Calyx 0. Petals four, staminiferous. Female.—Stigma oblique; nut or amara, one-seeded, included in the scales of the cone.

Spec. Char.—Leaves linear-lanceolate, mucronate, finely smooth.

Involucrum ovate, acuminate, longer than head. Scales of cone round, dilated, smooth.

Stem three feet high, stiff, round; flowers in terminal heads; peduncle very short; bractes grey; petals about an inch and a half long at the base, yellowish green, from thence gold colour; anthers narrow, long, obtusely mucronate; style incurved, round, short; seeds oblong, round, obtuse, smooth.

A native of the Cape of Good Hope. Flowers from April to June. It grows in light soil, well-drained and not over-watered, and is increased by ripened cuttings planted in sand under a hand-glass.

### CANELLA ALBA.

WHITE, OR LAUREL-LEAVED CANELLA.

Dodecandria Monogynia.—LINN.

Guttiferæ.

Gen. Char.—Calyx three-lobed; petals five: anthers sixteen, united to an urceolate nectary; berry one-celled; two-four-seeded.

Spec. Char.—Leaves oblong, obtuse, shining; racemes terminal.

The stem rises from ten to fifty feet in height, very straight and upright, and branched only at the top. The branches are

1. Podalyria biflora.

2. Coronilla Emerus.

3. Leucadendrum strictum.

4. Canella alba.

5. Protea Lepidocarpon.

6. Protea Cordifolia.

7. Besleria scandens.

8. Cassia Corymbosa.

9. Iria Rochensis.

10. Rhododendron Dauricum.

11. Rosmarinus officinalis.

erect, and not spreading; furnished with petiolated leaves, irregularly attenuate, without any distinct nerves or veins, of a dark green colour, thick like that of the laurel, and shining: the back is whitish, by which it is commonly known at first sight in the woods. The flowers, which grow at the extremities of the branches in clusters, upon divided foot-stalks, are small, of a violet colour, and seldom open. The calyx is one-leaved, persistent, and deeply divided into three lobes; lobes roundish, concave, incumbent, smooth, membraneous. The petals are five times as long as the calyx, oblong, sessile, concave, erect, two a little narrower than the others; nectary pitcher-shaped, the length of the petals. Filaments none; but the anthers, which are twenty-one in number, adhere longitudinally to the outside of the nectary, and discharge a yellow pollen. Germen superior, within the nectary, ovate, three-celled; style cylindrical; stigmas two, rough, convex, blunt. Fruit an oblong, fleshy, one-celled, smooth, black berry.

This tree is pretty common in most of the West India islands, growing in the inland woods, where it attains a considerable size. Every part of this tree exhales a powerful aromatic odour; and, when in blossom, perfumes the whole neighbourhood. In this country it requires to be kept in the stove, and thrives well in a loamy soil. It is increased, but with difficulty, by cuttings, taken off at a joint, and planted, in a moist heat, in a pot of sand, without depriving them of any of their leaves.

## PROTEA LEPIDOCARPON.

BLACK-FLOWERED PROTEA.

Tetrandria Monogynia.—Linn.

Proteaceæ.

Spec. Char.—Leaves lanceolate.

It is a handsome shrub, much branched; leaves sessile, quite entire, smooth, thick, rigid, minutely dotted on both sides, cartilaginously margined, terminated with a black callous point, most visible on the under side; flower solitary, terminal, sessile, inversely conical; outer scales of the calyx brown, ovate, recurved at the point, greenish at the lower part, black, velvety upwards, and terminated with a long black fur tipped with white; corollas many, enclosed petals two inches long, hairy, and terminated in a brush; three of them united together, and one distinct; germen surrounded with brown bristles: receptacle chaffy.

Native of the Cape of Good Hope. Requires the shelter of a greenhouse, except in the summer months. It is propagated by cuttings.

## PROTEA CORDIFOLIA.

HEART-LEAVED PROTEA.

Tetrandria Monogynia.—Linn.

Proteaceæ.

Gen. Char.—Calyx bipartite, unequal, with the stamen bearing divisions of the broader lip cohering. Style subulate. Stigma narrowly cylindrical.

Spec. Char.—Leaves cordate.

Stalks always of a bright red colour, not branched except very near the root, flexuose, from a span to a foot long. Leaves alternate, of a pale glaucous green colour, quite entire, with a red cartilaginous margin: stipulæ three or four, linear-lanceolate, deciduous; flower sessile, very near the root; scales of the calyx or involucrum imbricate, oblong-ovate, of a purplish red colour, very bright in the sunshine, with a scariose margin. Florets crowded on a flat receptacle: claws of the petal chaffy, diaphanous, three of them united and one distinct. The three concave segments of the limb of the coalesced petals enclose three of the linear anthers in such a manner as exactly to represent a large bilocular anther. The germ is surrounded by dull purple-coloured pappus.

Native of the Cape of Good Hope. Should be kept in a very airy part of the green-house, and planted in a loamy soil. May be propagated by cuttings.

## BESLERIA SCANDENS.

CLIMBING BESLERIA.

Didynamia Angiospermia.—Linn.

Scrophulariæ.

Gen. Char.—Calyx five-parted. Corolla campanulate; limb five-lobed, unequal. Capsule two-celled, irregularly dehiscent. Seed imbricated, membranous-winged.

Spec. Char.—Leaves cordate, triangular, acuminate, unequally toothed, with large teeth, terminating in sharp cartilaginous points.

Stem climbing, frutescent, becoming hard and woody at the base, much branched: branches spreading round in all directions, laying hold by the petioles of the leaves to each other, or to any other plant or stick within their reach. Leaves on long footstalks, variable in form, more or less tinged with dark purple: lower ones from four to six inches long, opposite; upper alternate, and much smaller. Petioles nearly cylindrical, purplish, clothed with glandular hairs. Flowers axillary, solitary, without bractcas, of a bright purple, varying to rose-colour. Calyx deeply scaly, densely clothed with slender hairs, tipped with minute glands. Corolla tubular at the base, becoming gradually companulate upwards, thickly clothed with glandular hairs; outside of a brilliant purple; on the inside from the mouth to the base are two lines of beautiful yellow hairs; having four fertile and one sterile, anthers two-lobed. Ovarium densely hairy. Style thinly hairy half way up.

This splendid climbing plant is a native of Mexico. With us a strong, free-flowering, greenhouse climber, that thrives well in a rich light soil, and is readily increased by young cuttings planted under glass, or by seeds.

## CASSIA CORYMBOSA.

CORYMBOSE CASSIA.

Decandria Monogynia.—Linn.

Leguminosæ.

Gen. Char.—Calyx five-leaved; petals five; three upper anthers sterile; three lower beaked.

Spec. Char.—Leaves three pairs, lanceolate, subfalcate, smooth, a gland between the lowest. Corymbs stalked. Pods cylindrical.

The leaves are without stipulæ, consist generally of three pair of leaflets, between the two lowermost of which is a small, conical, sharp-pointed gland: the bunches of flowers, about eight each, stand upon peduncles the length of the leaves to which they are axillary.

A very ornamental shrub, about five or six feet high. Mr. Watson informs us that, whilst confined to a pot and kept in the stove, it never flowered; removed into the green-house, it suffered from the cold, but when planted in the border of the conservatory it throve exceedingly and flowered freely.

Native of Buenos Ayres, in South America, flowering in August, and may be increased by cuttings.

## IXIA ROCHENSIS.

PLAID IXIA.

Triandria Monogynia.—Linn.

Irideæ.

Gen. Char.—Spatha two-valved. Flower with a slender tube and regular limb. Stigma three, narrow, recurved. Capsule globose, ovate.

Spec. Char.—Leaves subulate.

The leaves are firm, streaked and sheathing at the base; flowers upright; spathe large, striated, convolvulate-ovate; anthers small, sagittate, ovate; filaments erect; upwards slightly

patent; pistil nearly equal to the limb; stigma recurved over the anther.

It grows best in a mixture of sandy loam, and decayed leaves, or peat soil; when it has done flowering, it requires no water till it begins to grow afresh. In the month of October, it should be fresh potted, and set in a cool frame, as it only requires to be protected from frost till the pot is well filled with roots; then it may be set on the shelf in the green-house, or any convenient situation, and be watered regularly, and they will flower well; it may be increased by offsets from the bulbs, or by seeds.

## RHODODENDRON DAURICUM.

DAURIAN RHODODENDRON.

Decandria Monogynia.—LINN.

Rhodoraceæ.

Gen. Char.—Calyx five-parted. Corolla somewhat funnel-shaped. Stamen declinate. Capsule five-celled.

Spec. Char.—Leaves smooth, leprous beneath. Corolla funnel-shaped.

The leaves, which are dotted on both sides, continue all the winter on the plant in Siberia, and change to a brown colour; it sometimes happens that all of them fall off before the appearance of the flowers. The leaves, and more especially the bark, have a strong aromatic taste and smell, and the scales of the flower buds diffuse this odour some distance; the flowers are scentless.

This very beautiful shrub is peculiar to the subalpine tracts of Eastern Asia, occuring chiefly in the northern parts of Siberia, between Janisea and Lena rivers, where the northern sides of the mountains in the beginning of May are entirely empurpled by it.

It must, of course, be considered as a very hardy plant, though like many other inhabitants of the coldest regions, when cultivated in this country, from the greater mildness of our winters is apt to expand its flowers prematurely, which are usually destroyed by subsequent frosts and cold winds. On this account it is better, as soon as the blossoms begin to appear, to remove the plant under shelter, where it will prove exceedingly ornamental in the very depth of winter, but should the frost lay in early and continue so long as to retard the opening of the blossoms till its natural season, it might be suffered to continue in the open border.

## ROSMARINUS OFFICINALIS.

OFFICINAL ROSEMARY.

Diandria Monogynia.—LINN.

Labiatæ.

Gen. Char.—Corolla ringent; helmet arched, bifid; stamens curved with a tooth; seeds naked.

Spec. Char.—Leaves sessile.

It is an ever-green bushy plant, rising four or five feet high, much branched, downy, and thickly covered with leaves. The leaves are opposite, linear, about an inch in length, and one-sixth of an inch broad, dark green, smooth, and shining above, with the margin reflected, and woolly or whitish underneath. The blossoms, which stand on little opposite leafy branches, on short foot-stalks, are of a pale blue colour, variegated with purple and white, and exhaling, like the leaves, a strong fragrant odour, resembling camphor. The calyx is bell-shaped, and villous; the corolla is ringent, with the tube longer than the calyx, the upper lip erect and bifid; the lower divided into three segments; the middle larger, concave, and notched. The stamens are two, longer than the corolla, curved, and furnished with a minute lateral tooth. The anthers are oblong and blue; the style the length of the stamens, arched, and furnished with a simple pointed stigma. The seeds are four, naked, and situated at the base of the calyx.

Rosemary has a fragrant smell, and a bitter pungent taste. It was formerly highly esteemed for its virtues in nervous headaches; and its supposed quality of strengthening the memory, made it also an emblem of fidelity to lovers: thus, in a sonnet of 1584, we have:—

"Rosemary is for remembrance
Between us daie and night;
Wishing that I might alwaies have
You present in my sight."

## BABIANA SPATHACEA.

STIFF-LEAVED BABIANA.

Trindria Monogynia.—LINN.

Iridiæ.

Gen. Char.—Spatha two-valved, the inner valve two-parted. Flower tubular, with a six-parted limb. Stigmas three-spreading, seeds berried.

Spec. Char.—Tube filiform, twice as long as the regular limb. Segments obtuse, alternate with a point.

Leaves narrow, linear-lanceolate, villose, (those of old plants, with us commonly naked, but those of the younger bulbs always pubescent) very rigid, deeply plicate, terminating in an awn-like prickle; petioles long, widened at their bases; stem from four inches to near three feet high, with from two to four adpressed branches, and an upper spathe-like bracte or cauline leaf with a very long awn; rachis scarcely flexuose, many flowered; spathes imbricate-distich, largish, somewhat membranous, naked, smooth, twice shorter than the corolla, awned-acuminate, and sometimes torn; corolla narrow-funnel-formed, upright; tube filiform, straight; segments divided to the tube, than which they are twice shorter, linear-oblong, alternate, over-inclined to lanceolate, all regularly patent, turbinately contracted downwards, three of them generally terminated by a soft mucro. Anthers incumbent, linear above, the base of the segments beneath the stigma.

A native of the Cape of Good Hope, the least pubescent of its family, yet known to us. Flowers in June; requires the protection of a green-house.

## CROCUS SUSIANUS.

CLOTH OF GOLD CROCUS.

Triandria Monogynia.—LINN.

Irideæ.

Gen. Char.—Spatha usually two-valved. Flower funnel-shaped, regular; the outer segments largest. Tube very long, partly under ground. Stigma deeply trifid, with revolute segments.

Spec. Char.—Leaves many, acute, linear, keeled, sheathed.

Bulb clothed with coarse, wiry, fibrous, netted coverings, the outermost one of which has large irregular-shaped interstices; the coverings of that one smooth, scariose, shell-like, membranous, closely ribbed with fine parallel fibres, without the above-mentioned interstices.

This is a smaller plant in all its parts than the *Crocus vernus*, producing about two flowers from each mother bulb, whereas that throws up many in succession; this expands its flowers in all weathers, the three outer segments of which upwards are rolled back, and continue so even when the flower is closed in the evening, never returning to a straight position; in that the flowers only expand in clear or warm weather: while in vigour, all the segments open uniformly (none being revolule) and close in the same manner toward evening; in this, the stigmas are narrower, cowled, convolute, of a deep orange colour, and reach half their length above the anther; in that, they are convolute and flatly compressed, yellow, with their summits somewhat below the tops of the anthers. This is the earliest flower, and seems more easily affected by frost when in bloom.

END OF VOL. III.

Babiana Spathacea

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